

TECHNICAL MANUAL

AVIATION-CREW SYSTEMS

**AIRCREW PERSONAL PROTECTIVE
EQUIPMENT**

**(PROTECTIVE ASSEMBLY,
AIRCREW SURVIVAL - ARMOR
A/P22P-18(V))**

N68936-04-D-0008

**This manual update includes Basic, dated 1 March 1998, thru
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LIST OF EFFECTIVE PAGES

Insert latest changed pages; dispose of superseded pages in accordance with applicable regulations.

NOTE: On a changed page, the portion of the text affected by the latest change is indicated by a vertical line, or other change symbol, in the outer margin of the page. Changes to illustrations are indicated by miniature pointing hands. Changes to wiring diagrams are indicated by shaded areas.

Dates of issue for original and changed pages are:

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2-2	0	3-23	6	3-51 — 3-55	0
2-3 — 2-4	7	3-24	5	3-56	4
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3-15	2				

Major changes resulting from this change are as follows:

1. Incorporation of Aircraft Accident Report Inspection information.
2. Incorporation of Vertical Attachment of the HABD/SEA Pocket procedures.
3. Miscellaneous changes.

Zero in this column indicates an original page.

A Change 8

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CHAPTER 1

INTRODUCTION

1-1. GENERAL.

WARNING

Unauthorized modification to, and deviations from, prescribed life support and survival equipment by individual crewmen could create unknown safety hazards. The OPNAVINST 3710.7 Series specifies minimum requirements for such equipment and is supplemented by the individual model NATOPS.

1-2. The OPNAVINST 4790.2 Series identifies NAV-AIRSYSCOM as the only authority for modification to life support and survival equipment, which is usually accomplished by the Fleet Support Team (FST) (formerly Cognizant Field Activity (CFA)) via Aircrew System Changes or a change to the equipment procurement package. This manual also permits an operating activity, with approval of the controlling custodian, to conditionally modify ONE unit of equipment in-service in order to correct or overcome unsatisfactory conditions in that equipment item. Any other type of deviation, peculiar configuration, or modification to life support and survival equipment is not allowed, and fleet riggers have no authority or responsibility to perform them.

1-3. If an omission or conflict should occur between FST documents and NATOPS requirements, if there is a need for clarification of equipment configuration, or if equipment deficiencies are discovered, the applicable FST should be notified. The FST for Aircrew Personal Protective Equipment is Naval Air Warfare Center Aircraft Division (NAWCAD) Code 4.6.2.2, NAS Patuxent River, MD, 20670-1906. For parachutes and related hardware, including torso harnesses, the FST is the Naval Air Warfare Center Weapons Division, Code 463000D, China Lake, CA, 93555.

1-4. NAWCAD DET, Indianapolis, IN 46219, has cognizance over all survival radios and emergency beacons.

1-5. The Aviation Crew Systems manual is released under the authority of the Naval Air Systems Command in compliance with the request of the Chief of Naval Operations. The instructions contained herein are mandatory. This manual consists of separately bound volumes, as listed below:

TITLE	PUBLICATION NUMBER
Inflatable Survival Equipment (Liferafts)	NAVAIR 13-1-6.1-1
Inflatable Survival Equipment (Life Preservers)	NAVAIR 13-1-6.1-2
Parachutes	NAVAIR 13-1-6.2
Seat Survival Kits (Oxygen Hoses and Non-SKU Seat Kits)	NAVAIR 13-1-6.3-1
Seat Survival Kits (SKU Series Seat Kits)	NAVAIR 13-1-6.3-2
Oxygen Equipment (Aircraft Equipment, Masks, and Other Systems)	NAVAIR 13-1-6.4-1
Oxygen Equipment (Regulators)	NAVAIR 13-1-6.4-2
Oxygen Equipment (Concentrators)	NAVAIR 13-1-6.4-3
Oxygen Equipment (Converters)	NAVAIR 13-1-6.4-4
Rescue and Survival Equipment	NAVAIR 13-1-6.5
Aircrew Personal Protective Equipment (Aircrew/Passenger Equipment)	NAVAIR 13-1-6.7-1
Aircrew Personal Protective Equipment (Clothing)	NAVAIR 13-1-6.7-2
Aircrew Personal Protective Equipment (Helmets and Masks)	NAVAIR 13-1-6.7-3
Aircrew Personal Protective Equipment (Protective Assembly, Aircrew Survival - Armor)	NAVAIR 13-1-6.7-4
Special Missions Aircrew Equipment	NAVAIR 13-1-6.10

NAVAIR 13-1-6.7-4

1-6. The purpose of this volume is to provide technical information related to the configuration, application, function, inspection, and maintenance of a particular category of aircrew safety and survival equipment. The information contained in each volume is intended for Organizational, Intermediate, and Depot Levels of maintenance as established within the Naval Aviation Maintenance Program (OPNAVINST 4790.2 Series).

1-7. DESCRIPTION OF NAVAIR 13-1-6.7-4.

1-8. CONTENTS. This volume contains information on configuration, application, function, inspection, and maintenance of Protective Assembly, Aircrew Survival - Armor, A/P22P-18(V).

1-9. CONFLICTS AND SUPERSEDURES. This volume shall take precedence over all other documents except for effective related Aircrew System Bulletins and Changes, and Interim Aircrew System Bulletins and Changes. These documents are effective until officially rescinded, canceled, or superseded.

1-10. The modifications section of each chapter lists all effective changes which affect Aircrew Personal Protective Equipment and have been issued on or before the date of latest change or revision to this volume. When applicable, the subject matter of these documents has been incorporated within the text of the appropriate chapters.

1-11. Effective changes and bulletins which effect Aircrew Personal Protective Equipment and are issued between changes and revisions to this volume should be recorded in the modification section of the manual for the affected equipment by annotating the outer margin of the page with a vertical line and the number of the change or bulletin. A copy of the change or bulletin should be filed in a separate binder in the ALSS work center. When this volume is updated these documents will be listed in the modification sections of the applicable chapters and the text of the chapters will be updated to reflect the changes and bulletins.

1-12. UPDATING. These volumes will be updated periodically by the issuance of a revision, which is a 100 percent replacement of pages. Between revisions, changes and rapid action changes will be released, which are partial replacement of pages. All added and changed pages shall be incorporated in these volumes according to page number. Superseded and deleted pages shall be discarded in accordance with the local security procedures for data containing distribution statements. A list of effective pages is provided with each change. A summary of the major

changed areas for a particular change or revision is located directly beneath the list of effective pages.

1-13. COMMENTS AND RECOMMENDATIONS. Comments and recommendations shall be submitted using established deficiency reporting systems in accordance with OPNAVINST 4790.2 Series.

1-14. ENGINEERING DRAWINGS. Government engineering drawings are available to the fleet by submitting a letter of request to Commanding Officer, Naval Air Technical Data and Engineering Service Command, Naval Air Station North Island, P.O. Box 357031, Building 90 Distribution, San Diego, CA 92135-7031. Each request should include the equipment nomenclature, part number, and CAGE code. The drawings will be provided in the form of aperture cards (Automatic Data Processing Punch Cards). Technical data may also be obtained online at the NATEC website located at <http://www.natec.navy.mil>. Authorized users must first establish an account prior to obtaining data. Access/account information can be obtained at the NATEC website.

1-15. TECHNICAL DIRECTIVES AND FORMS. NATEC is the central management activity for aeronautical technical publications, engineering drawings and associated technical services. Upon release, NATEC will forward to all designated activities, copies of Technical Directives and Forms. Additional copies are available utilizing the procedures shown in paragraph 1-14 as well as from the PMA-202 website at <https://pma202.navair.navy.mil>.

1-16. QUALITY ASSURANCE. Quality assurance steps are provided for critical operations. When a step is underlined, the Aircrew Survival Equipmentman shall perform the operation and then have performance verified by a Collateral Duty Inspection (CDI-CDQAR-QAR) as established within the Naval Aviation Maintenance Program (OPNAVINST 4790.2 Series) prior to proceeding to the next operation. In no case shall an Aircrew Survival Equipmentman perform his/her own quality assurance inspection.

1-17. LEVELS OF MAINTENANCE.

1-18. Maintenance, inspection, repair, and overhaul shall be performed at the established level of maintenance in accordance with and as defined in OPNAVINST 4790.2 Series. In cases of necessity, such as at very small activities, Organizational and Intermediate Levels may be combined within local capabilities. It is recognized that, due to conditions other than those assumed here, minor deviations to procedures outlined in this manual may be unavoidable. Prior to forwarding to a depot facility, it shall be definitely determined that maintenance cannot be performed at a lower level.

1-19. SUPPLEMENTARY PUBLICATIONS.

1-20. In addition to Interim Aircrew System Bulletins and Changes, and Aircrew System Bulletins and Changes which are still in effect, the following publications supplement this volume.

1. NAVAIR 00-35QH-2, Allowance List, Aviation Life Support System and Airborne Operation Equipment for Aircraft Squadrons Navy and Marine Corps.

2. OPNAV INSTRUCTION 4790.2 (Series). The Naval Aviation Maintenance Program.

3. NAVSUP Manual, paragraph 25841, Flight Clothing and Operational Equipment, provides instruction for issue of clothing and equipment to designated personnel.

4. OPNAVINST 4410.2A.

5. OPNAV INSTRUCTION 3710.7 provides general instructions on required minimums for Aircrew Personal Protective Equipment.

6. NATOPS MANUALS provide information on required Aircrew Personal Protective Equipment.

7. NAVSUP PUBLICATION 2002 lists directives and manuals available from Naval Publications and Forms Center.

8. NAVAIR 13-1-6-8 Work Unit Code Manual lists work unit codes assigned to survival equipment.

9. NAVSUPINST 4423.29 (Series). Naval Material Command (NMC) Uniform Source, Maintenance and Recoverability (SM&R) Codes.

10. NAVAIR 01-1A-509 Cleaning and Corrosion Control Manual.

11. ASTM-D-6193 Standard Practices for Stitches and Seams.

12. P2300, Repairable Assemblies (lists repairable assemblies and applicability of Navy aviation materials).

13. P2310, Supporting Repair Parts (lists supporting parts of Navy aviation materials).

14. NAVSUP P-719 is a Guide for the Assignment and Use of Source, Maintenance and Recoverability (SM&R) Codes.

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CHAPTER 2

MAINTENANCE CONCEPTS, SCHEDULING AND DOCUMENTATION

Section 2-1. Maintenance Concepts

2-1. GENERAL.

2-2. NAVAL AVIATION MAINTENANCE PROGRAM. All maintenance and inspection actions upon Aviation Life Support Systems (ALSS) equipment shall be made as part of the Naval Aviation Maintenance Program in accordance with OPNAVINST 4790.2 Series.

2-3. LEVELS OF MAINTENANCE. Maintenance of ALSS equipment shall be performed at the established level of maintenance in accordance with OPNAVINST 4790.2 Series.

2-4. QUALIFIED PERSONNEL. Refer to OPNAVINST 4790.2 Series for qualifications of personnel authorized to perform maintenance actions on ALSS equipment.

Section 2-2. Maintenance Scheduling

2-5. GENERAL.

2-6. INSPECTION CYCLES. Scheduled maintenance requirements for aircraft and man-mounted equipment are published in the applicable aircraft maintenance requirement cards and this manual.

NOTE

To meet unusual situations and facilitate workload scheduling, refer to OPNAVINST 4790.2 Series for authorized deviations to scheduled phase inspection intervals.

Section 2-2A. Accident Evaluation

2-6A. AIRCRAFT ACCIDENT REPORT INSPECTION.

2-6B. Any Aviation Life Support System Equipment along with related subassemblies or equipment which have been recovered following use in an emergency ditching/bailout or ejection (refer to NAVAIR 13-1-6.2 for personnel and drogue parachutes) will be returned to the nearest Naval Supply Activity for shipment via traceable means to: Code 4.6.3.3, Naval Air Warfare Center Aircraft Division, Bldg 2187, 48110 Shaw Rd., Unit 5, Patuxent River, MD 20670-1906.

NOTE

Under no circumstances will any piece of Aviation Life Support System equipment which has been subjected to ditching/bailout or ejection be returned to service.

2-6C. Stencil outside of container in 1-inch letters as follows: THIS EQUIPMENT HAS BEEN USED IN AN EMERGENCY. These items of equipment are required for evaluation and determination of design deficiency and to establish requirements for product improvement.

Section 2-3. Maintenance Documents

2-7. GENERAL.

2-8. DOCUMENTING MAINTENANCE ACTIONS. Upon completion of any maintenance action (e.g., inspections, repairs, modifications), appropriate entries shall be made on applicable maintenance records, in accordance with OPNAVINST 4790.2 Series. The entries by the Aircrew Survival Equipmentman shall provide a systematic record of equipment history

and the documentation of all maintenance actions performed on the equipment.

2-9. MAINTENANCE DOCUMENTS. Refer to OPNAVINST 4790.2 Series for documents used to record history or to document maintenance actions or for additional information for completion of maintenance records. These records are designed to provide continuous configuration and inspection records throughout the service life of ALSS assemblies and their components.

Section 2-4. Illustrated Parts Breakdown Information

2-10. GENERAL.

2-11. This section explains the Illustrated Parts Breakdown (IPB) for ALSS equipment. The IPB can be found at the end of each chapter where applicable. The IPB should be used during maintenance when requisitioning and identifying parts.

2-12. SYMBOLS AND ABBREVIATIONS. Symbols and abbreviations used in the Illustrated Parts Breakdown are as follows:

Symbol	Definition
---*---	Closure (end) of attaching parts
#	Selected part, only one used
x	By (used in dimensions 12 in. x 6 in.)
&	And

Abbreviation	Definition
AR or A/R	As Required
CAGE	Commercial and Government Entity
COML	Commercially available
FIG, Fig	Figure
GAPL	Group Assembly Parts List
GFE	Government Furnished Equipment
IPB	Illustrated Parts Breakdown
L.H.	Left Hand
MAINT	Maintenance
NHA	Next Higher Assembly
No.	Number
RECOVER, RECY	Recoverability
REF	Reference
R.H.	Right Hand
SM&R	Source, Maintenance and Recoverability
Spec. Cont.	
Dwg. or SCD	Specification Control Drawing

2-13. GROUP ASSEMBLY PARTS LIST.

2-14. The Group Assembly Parts List (GAPL) contains illustrations and parts lists for each major assembly. These illustrations and accompanying lists show how the major assemblies are disassembled into subassemblies and detail parts. Each item illustrated is indexed for identification purposes. Each illustration

is accompanied by a parts list providing a part number, description, and quantity for each item. The list is arranged in disassembly order. Through the use of a system of indentation, the relationship of the detail parts to the subassemblies and the relationship of the subassemblies to the main assembly, is shown.

2-15. FIGURE AND INDEX NUMBER COLUMN. The figure and index number of each item shown on the corresponding illustration appears in the Figure and Index Number Column, with the exception of assemblies and subassemblies which are not illustrated in assembled form. In these cases, the assemblies or subassemblies are listed but not indexed. The component parts thereof are both listed and indexed.

2-16. PART NUMBER COLUMN. This column contains the contractor's drawing number, government standard number, vendor drawing number or identifies the part as being commercial hardware (COML). Government standard parts are listed using the applicable MS, AN, AF, NAF, MIL, or JAN part number. Where the part number is controlled by a military specification, this specification number is listed in the Description Column.

2-17. DESCRIPTION COLUMN. This column lists the item name plus those modifiers necessary to identify the item. The description of a vendor-supplied item includes a five-digit number which identifies the manufacturer. This is the Commercial and Government Entity (CAGE) code. To correlate this CAGE code to the manufacturer's name, refer to the cataloging handbook H4/H8. CAGE codes may be omitted for prime manufacturer's parts and for government standard parts. When applicable, contractor's control drawing numbers and reference designations of electronic parts are also listed for general reference. When a separate exploded view is used to show the detail parts of an assembly or subassembly the Description Column contains an appropriate figure cross-reference in parenthesis following the description. This cross-reference appears both in the listing where the assembly is first described, and in the listing which the assembly is broken down. In the latter case, the abbreviation REF will appear in the Units Per Assembly column. Commercial hardware items (COML) are fully described so that they may be procured from normal commercial sources. Parts stocked in kits are identified with kit component code in this column, i.e., KD.

2-18. Indentation. The indentations headed “1” through “7” in the Description Column are provided to show the relationship of assemblies and their detail parts. The detail parts are indented one space to the right and listed below the assembly to which they belong. Determine the next higher assembly (NHA) of any detail part by locating, in the next space to the left (excluding attaching parts) the first item above the detailed part.

1 2 3 4 5 6 7

ARTICLE (or MAIN ASSEMBLY)

. Detailed parts for ARTICLE (or MAIN ASSEMBLY)

. ASSEMBLY

(ATTACHING PARTS)

. ATTACHING PARTS FOR ASSEMBLY

---*---

. . Detailed parts for ASSEMBLY

. . SUBASSEMBLY

(ATTACHING PARTS)

. . ATTACHING PARTS FOR SUBASSEMBLY

---*---

. . . Detailed Parts for SUBASSEMBLY

. . . SUB-SUBASSEMBLY

(ATTACHING PARTS)

. . . ATTACHING PARTS FOR SUB-SUBASSEMBLY

---*---

. . . . Detailed parts for SUB-SUBASSEMBLY

2-19. Attaching Parts. Attaching parts are items used to attach parts or assemblies to each other and follow immediately after the part to be attached. The attaching parts have the same indentation as the part attached. The caption “(ATTACHING PARTS)” is placed on the line immediately above the listing of attaching parts. The separation symbol ---*--- appears on the line immediately under the last attaching part. Quantities of attaching parts are listed per unit. For example, if two fittings are required for each assembly and one bolt is required to attach each fitting, the correct listing would be:

. FITTING ASSEMBLY, Hinge 2
(ATTACHING PARTS)

. BOLT 1
---*---

2-20. UNITS PER ASSEMBLY COLUMN. This column shows the quantity of an item required in the next higher assembly. The abbreviation AR indicates when the quantity is “As Required”.

2-21. USABLE ON CODE COLUMN. Usable on codes are used to indicate part usage where various models and serial numbers of the equipment or similar parts within the equipment use different parts. A

code is assigned to each variation of the equipment and entered into the GAPL when a part is used only in a specified variation. Where no code is entered, the part is used on all units covered by the GAPL or when no variations from the original equipment exist.

2-22. SOURCE, MAINTENANCE AND RECOVERABILITY (SM&R) CODE COLUMN. The five digit SM&R codes, assigned by Naval Air Systems Command Representatives are reflected in the SM&R code column. The code format is composed of three parts consisting of a two-position Source Code, a two-position Maintenance Code and a one-position Recoverability Code. See Table 2-1 for basic information.

NOTE

For more complete information on Uniform SM&R Codes, refer to NAVSUPINST 4423.29, OPNAVINST 4410.2A, and NAVSUP P-719.

2-23. NUMERICAL INDEX.

2-24. The numerical index follows the last GAPL in any chapter and contains all the part numbers listed in all GAPLs, arranged in alphabetical-numerical sequence.

2-25. PART NUMBER COLUMN. This column contains the part numbers of the parts and assemblies. Part number arrangement starts at the extreme left-hand position and continues left to right, one position at a time, according to the following order or precedence:

Space	(blank column)
Diagonal	(Slant)
Point	(period)
Dash	(hyphen)
Letters	A through Z
Numerals	0 through 9

NOTE

Spaces, diagonals, points, and dashes do not appear in the extreme left-hand position of the part numbers. However, they may be used in the second and succeeding positions and take precedence over letters and numbers as indicated above.

2-26. FIGURE AND INDEX NUMBER COLUMN. In this column, the digits preceding the dash refer to the figure in which the parts are illustrated. The digits following the dash are the index numbers.

Table 2-1. Source, Maintenance, and Recoverability (SM&R) Code Definitions

SOURCE			MAINTENANCE				
1st POS	2nd POSITION		3rd POSITION		4th POSITION		
MEANS OF ACQUIRING SUPPORT			USE: LOWEST LEVEL AUTHORIZED TO REMOVE/ REPLACE THE ITEM.		REPAIR: LOWEST LEVEL WITH CAPABILITY AND RESOURCES TO PERFORM COMPLETE REPAIR ACTION.		
P	A	ITEM: STOCKED	O	ORG/UNIT	O	ORG/UNIT	
	B	ITEM: STOCKED, INSURANCE					
	C	ITEM: STOCKED, DETERIORATIVE					
	D	ITEM: SUPPORT, INITIAL ISSUE OF OUTFITTING & STOCK ONLY FOR ADDITIONAL INITIAL ISSUE	2 3 4	MINESWEEPER SUBMARINES AUX/AMPHIB	2 3 4	MINESWEEPER SUBMARINES AUX/AMPHIB	
	E	EQUIPMENT: SUPPORT, STOCKED FOR INITIAL ISSUE OR OUTFITTING OF SPECIFIED MAINTENANCE ACTIVITIES	5 6	DESTROYER, FFG CRUISER/CARRIER	5 6	DESTROYER, FFG CRUISER/CARRIER	
	F	EQUIPMENT: SUPPORT, NONSTOCKED, CENTRALLY PROCURED ON DEMAND	F	I/AFLOAT	F	I/AFLOAT	
	G	ITEM: STOCKED FOR SUSTAINED SUPPORT. UNECONOMICAL TO PRODUCE AT A LATER TIME					
	H	ITEM: STOCKED, CONTAINS HAZMAT. HMIS/MSDS REPORTING REQUIRED					
		R	TERMINAL OR OBSOLETE, REPLACED	G	ASHORE AND AFLOAT	G	ASHORE AND AFLOAT
		Z	TERMINAL OR OBSOLETE, NOT REPLACED				
K	D	ITEM: DEPOT O/H & MAINTENANCE KITS	H	I/ASHORE	H	I/ASHORE	
	F	ITEM: MAINTENANCE KIT, PLACE AT O, F, H, L					
	B	ITEM: IN BOTH DEPOT REPAIR AND MAINT. KITS					
M	O	MFR OR FAB AT UNIT LEVEL	K	CONTRACTOR FACILITY	K	CONTRACTOR FACILITY	
	F	MFR OR FAB AT INTERMEDIATE/DS LEVEL					
	H	MFR OR FAB AT INTERMEDIATE/GS LEVEL					
	L	MFR OR FAB AT SPECIALIZED REPAIR ACTIVITY (SRA)					
	G	MFR OR FAB AT ASSEMBLED AFLOAT OR ASHORE					
	D	MFR OR FAB AT DEPOT MAINTENANCE LEVEL					
A	O	ITEM: ASSEMBLED AT ORG/UNIT	L	INTERMEDIATE SRA	L	INTERMEDIATE SRA	
	F	ITEM: ASSEMBLED AT INTERMEDIATE LEVEL - AFLOAT					
	H	ITEM: ASSEMBLED AT INTERMEDIATE LEVEL - ASHORE	D	DEPOT	D	DEPOT	
	L	ITEM: ASSEMBLED AT SRA					
	G	ITEM: ASSEMBLED AFLOAT OR ASHORE					
	D	ITEM: ASSEMBLED AT DEPOT MAINTENANCE LEVEL					
X	A	ITEM: REQUISITION NEXT HIGHER ASSEMBLY	Z	REF ONLY	Z	NON-REPAIRABLE	
	B	ITEM: NOT PROCURED OR STOCKED, AVAILABLE THRU SALVAGE, REQ. BY CAGE/PART NUMBER					
	C	INSTALLATION DRAWING, DIAGRAM, INSTRUCTION SHEET, IDENTIFY BY CAGE/PART NUMBER			B	RECONDITION	
	D	NON-STOCKED, OBTAIN VIA LOCAL PURCHASE					

RECOVERABILITY		SERVICE OPTION CODE	
5th POSITION		6th POSITION	
DISPOSITION: WHEN UNSERVICEABLE OR UNECONOMICALLY REPAIRABLE, CONDEMN OR DISPOSE.		ASSIGNED TO SUPPORT ITEMS TO CONVEY SPECIFIC INFORMATION TO THE SERVICE'S LOGISTICS COMMUNITY/OPERATING FORCES.	
O	ORG/UNIT	1	I-LEVEL 1ST DEGREE
F	I/AFLOAT	2	I-LEVEL 2ND DEGREE
G	ASHORE AND AFLOAT	3	I-LEVEL 3RD DEGREE
H	I/ASHORE	6	COMMERCIAL ITEM, ORGANICALLY MFR'D
K	DLR; CONTRACTOR FACILITY	8	NON-CONSUMABLE; 2ND DEGREE ENGINE I-LEVEL
		9	NON-CONSUMABLE; 3RD DEGREE ENGINE I-LEVEL
L	INTERMEDIATE SRA LEVEL	E	END TO END TEST
		J	INTER-SERVICE DLR REPAIRABLE BELOW D-LEVEL
D	DLR; CONDEMN OR DISPOSE AT DEPOT	P	PROGRESSIVE MAINTENANCE
Z	NON-REPAIRABLE	R	GOLD DISC REPAIR
A	NON-REPAIRABLE BUT REQUIRES SPECIAL HANDLING	T	TRAINING DEVICES

CHAPTER 3

PROTECTIVE ASSEMBLY, AIRCREW SURVIVAL - ARMOR A/P22P-18(V)

Section 3-1. Description

3-1. GENERAL.

3-2. The Protective Assembly, Aircrew Survival - Armor A/P22P-18(V) (formerly referred to as AIR-SAVE) is a tri-service effort designed to replace existing survival vests (Navy/Marine Corps AISAP, the Army SARVIP, and the Air Force CMU-21/P) and be usable in all aircraft communities.

1. The A/P22P-18(V) Protective Assembly is compatible with Navy/Marine Corps LPU-21/P, LPU-23/P, LPU-34/P, and LPU-36/P; Air Force LPU-9, and Army LPU-10 life preservers. Enhanced aircrew vital organ protection is provided since the vest assembly is also compatible with soft and hard armor assemblies (PRU-60/P22P-15 or PRU-60A/P22P-15 and PRU-61/P22P-15 or PRU-61A/P22P-15 respectively) and the Army's .50 caliber armor plate. The soft armor assembly can be worn in combination with other components to provide small arms fire and fragmentation protection including high velocity shrapnel from anti-aircraft rounds. PRU-61/P22P-15 and PRU-61A/P22P-15 hard armor, in conjunction with soft armor, provides protection against up to .30 caliber armor-piercing (APM-2) rounds. The Army's hard armor plate provides standoff protection against .50 caliber rounds. When the Army's .50 caliber hard armor plate is worn, a different encasement is used than that used for the .30 caliber armor plate. The A/P22P-18(V) vest has been designed to provide one-hand, two-operation quick disconnect of the hard armor plate.

2. The A/P22P-18(V) Protective Assembly comes in one size accompanied by removable stowage pockets for a radio, a knife, five general purpose pockets (all the same size), an Oxygen/CBR attachment strap, and a flashlight keeper. Optional HEED/HABD and pistol/ammo pockets, and additional stowage pockets may be obtained through normal supply channels.

NOTE

Survival items must be ordered separately; they do not come from supply with the stowage pockets.

3-3. ENSEMBLE CONFIGURATION.

3-4. The Protective Assembly, Aircrew Survival - Armor A/P22P-18(V) consists of the following:

CMU-33A/P22P-18(V) Survival Vest
(Type I or Type II)

PRU-60/P22P-15 or PRU-60A/P22P-15 Small Arms
Protective Soft Body Armor

PRU-61/P22P-15 or PRU-61A/P22P-15 Small Arms
Protective Hard Body Armor or Army .50 caliber
Hard Body Armor

LPU-21/P Series, LPU-23/P Series, LPU-27/P,
LPU-35/P and the Low Profile Series (LPU-34/P,
-36/P, or -37/P) Life Preserver (Navy)
or

LPU-9 Life Preserver (Air Force)
or

LPU-10 Life Preserver (Army)

1. The Type I CMU-33A/P22P-18(V) survival vest (3561AS301-1) includes a removable hoisting harness which is only removed during maintenance and shall be worn with the vest during all flight missions. The Type II vest (3561AS300-1), which does not have the built-in hoisting harness capability, was designed for aircrewmembers who wear a torso harness. Aircrews of fixed-wing ejection seat aircraft and some fixed-wing, non-ejection seat (FWNES) aircrewmembers will wear the PCU-33 Series or PCU-56 Series harness under the Type II vest.

2. Pockets for the stowage of survival items attach to the horizontal webbing sewn to the vest. Each pocket has a strap on the back which is interwoven or reeved through the horizontal webbing loops of the vest then secured to the pocket by omni-directional snap fasteners.

3. The detachable stowage pockets permit various configurations of survival items and equipment. This makes it possible to configure the most compatible assembly of survival items for the aircraft and mission being flown; including those special configurations for each of the services for flights into areas requiring chemical, biological, or radiation protection.

4. Both the Type I and Type II vests come equipped with LPU-21/P and LPU-23/P collar lobe attachment straps.

NAVAIR 13-1-6.7-4

3-5. The PRU-60/P22P-15 Small Arms Protective Soft Body Armor, consisting of front, back and side panels, is available in small, medium, large and extra large sizes. It is available on the GSA schedule and can be ordered direct from the manufacturer, Protective Materials Company, Tel: 305-820-4414. The PRU-60A/P22P-15 Small Arms Protective Soft Body Armor, consisting of front and back sections, is available in two sizes, medium and large. Aircrewmembers in aircraft positions with armored seats may remove the back soft ballistic insert from its casing and wear only the front soft armor. However, after removal of the rear ballistic armor insert, the back casing must remain attached to the front casing to retain the front armor in the proper position on the wearer. If the soft ballistic inserts are damaged in any way, the entire soft body armor assembly must be replaced. See [Section 3-4](#) for further information on the PRU-60A/P22P-15. See NAVAIR 13-1-6.7-2 if using the PRU-60/P22P-15.

3-6. The PRU-61A/P22P-15 Small Arms Protective Hard Body Armor is available in two sizes; medium and large. The small arms hard body armor is available as a complete assembly consisting of front hard armor plate with beaded pull handle, back hard armor plate with connecting quick disconnect, and back hard armor retaining and support straps. The PRU-61/P22P-15 Small Arms Protective Body Armor is available in four sizes; small, medium, large and extra large. The PRU-61/P22P-15 Small Arms Protective Soft Body Armor is available on the GSA schedule and can be ordered direct from the manufacturer, Protective Materials Company, Tel: 305-820-4414. It is available as a complete assembly consisting of hard front armor with

beaded pull handle, back hard armor plate with connecting quick disconnect and back hard armor retaining straps. For the PRU-61/P22P-15 back armor plate to be utilized with the CMU-33A/P22P-18(V) back hard armor, support straps must first be fabricated as shown in [paragraph 3-87](#). If authorized by type command, a hard armor assembly consisting only of the front hard armor plate and beaded pull handle may be worn by aircrewmembers in positions having armored seats. If the hard ballistic inserts are damaged they must be sent to I-level for inspection and disposition. Replacements for the front or back hard armor plates may be obtained through normal supply channels. See [Section 3-4](#) for further information on the PRU-61A/P22P-15. See NAVAIR 13-1-6.7-2 if using the PRU-61/P22P-15. During over-land operations, army, navy, and marine aviators and crewmembers may completely close the slide fastener on the vest. This reinforces the requirement for ensuring the vest is properly adjusted for wearing armor, since this negates the use of the Beaded Quick Release Handle. However, when flying over water the requirement for the beaded handle is still in force. Crewmembers, when wearing the rear ballistic plate, must still connect the Beaded Quick Release Handle for attachment and removal of the rear plate. However, during the conduct of over-land operations, crewmembers need only utilize the top two snaps of the Beaded Quick Release Handle to the vest. The lower six inches of the Beaded Quick Release Handle with the four remaining snaps may be rolled up and secured with tape or rubber bands.

3-7. Refer to NAVAIR 13-1-6.1-2 for life preserver maintenance procedures.

Section 3-2. Survival Vest, CMU-33A/P22P-18(V), Types I and II

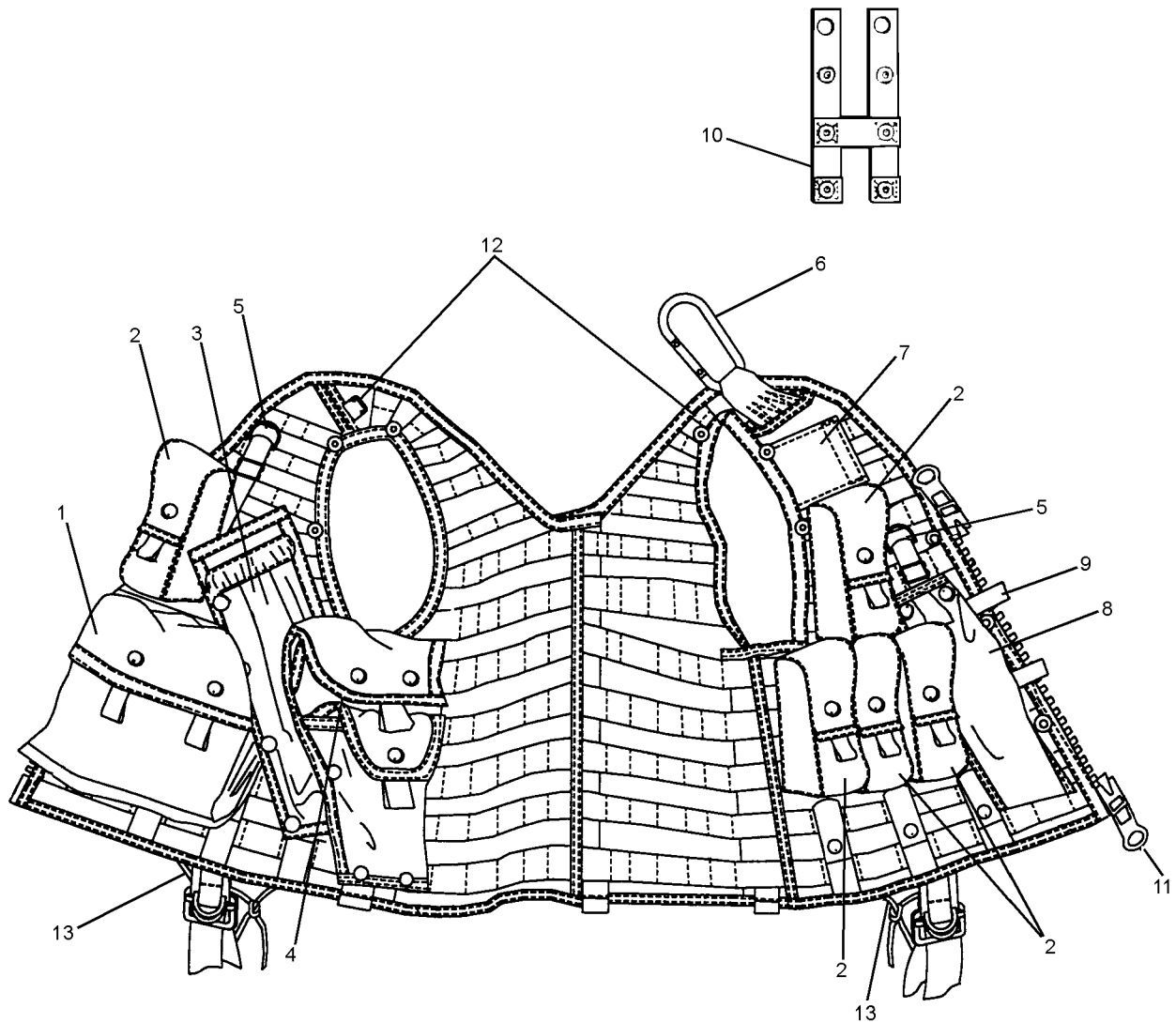
3-8. GENERAL.

3-9. The CMU-33A/P22P-18(V) Survival Vest is designed to be compatible with PRU-60/P22P-15, PRU-60A/P22P-15, PRU-61/P22P-15, and PRU-61A/P22P-15 armor assemblies, Army .50 caliber armor assembly and Navy, Air Force, and Army life preserver assemblies. The vest's survival equipment stowage pockets are modular, permitting survival items to be configured to suit type command requirements and different environments. There are two configurations of the vest, Type I ([figure 3-1](#)) and Type II ([figure 3-2](#)). The Type I vest (3561AS301-1) has an integrated removable hoisting harness, designed for use by aircrews of helicopters and most fixed-wing non-ejection seat aircraft (FWNES). The Type II vest (3561AS300-1) has no integrated hoisting harness but comes with torso harness attachment straps. The Type II vest is designed to integrate with torso harnesses such as the PCU-33 Series or PCU-56 Series worn by fixed-wing ejection seat aircraft aircrews and some FWNES aircrews.

3-2 Change 6

3-10. CONFIGURATION.

3-11. The CMU-33A/P22P-18(V) vest is constructed with fire-retardant (FR) coated nylon mesh fabric with one-inch wide FR coated nylon webbing sewn in parallel horizontal strips, with one-inch separation, over the exterior of the vest. Each horizontal strip of webbing is attached to the mesh of the vest by vertical stitching evenly spaced along the horizontal length of the strip. This method of attachment provides the necessary loops for multiple configurations of stowage pockets and individual sizing in the fitting process. Woven aramid (nomex) stowage pockets are attached to the vest by interlacing the straps sewn to the back of the pockets through the loops of the horizontal webbing strips. The straps are then secured to the pocket with omnidirectional snaps. The radio pocket is large enough for a PRC-112B radio. If a smaller radio is being used by the aircrew, one of the general purpose pockets may be used to stow the radio. The larger radio pocket may then be used to stow optional survival items. If necessary, other general purpose pockets may be obtained for additional survival items. Each vest also has four inside pockets for stowage of water bags and other selected survival items.

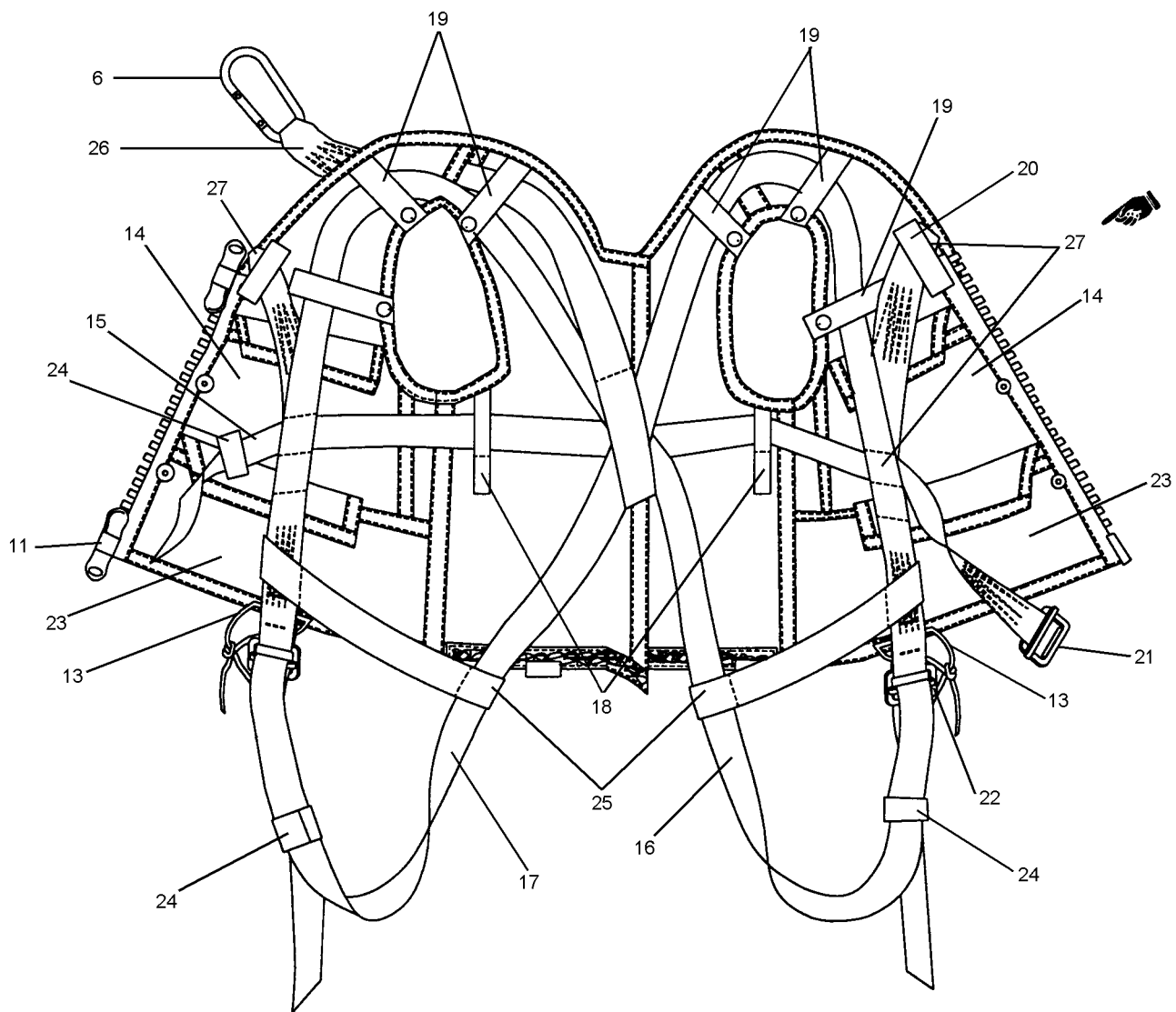


(EXTERIOR)

- | | |
|--|-------------------------------|
| 1. RADIO POCKET | 7. HOIST RING COVER |
| 2. GENERAL POCKET (5) | 8. KNIFE POCKET |
| 3. HEED (SRU-36/P) POCKET OR
HABD (SRU-40/P)/SEA POCKET (SHOWN) | 9. FLASHLIGHT KEEPER |
| 4. PISTOL HOLSTER POCKET
WITH AMMO KEEPER (OPTIONAL) | 10. OXYGEN/CBR ATTACHMENT |
| 5. COLLAR LOBE ATTACHMENT (2) | 11. SLIDE FASTENER |
| 6. HOIST RING | 12. LOOP LOCS (2) |
| | 13. HARNESS RETAINER CORD (2) |

00300101

Figure 3-1. Survival Vest CMU-33A/P22P-18(V), Type I (Sheet 1 of 2)

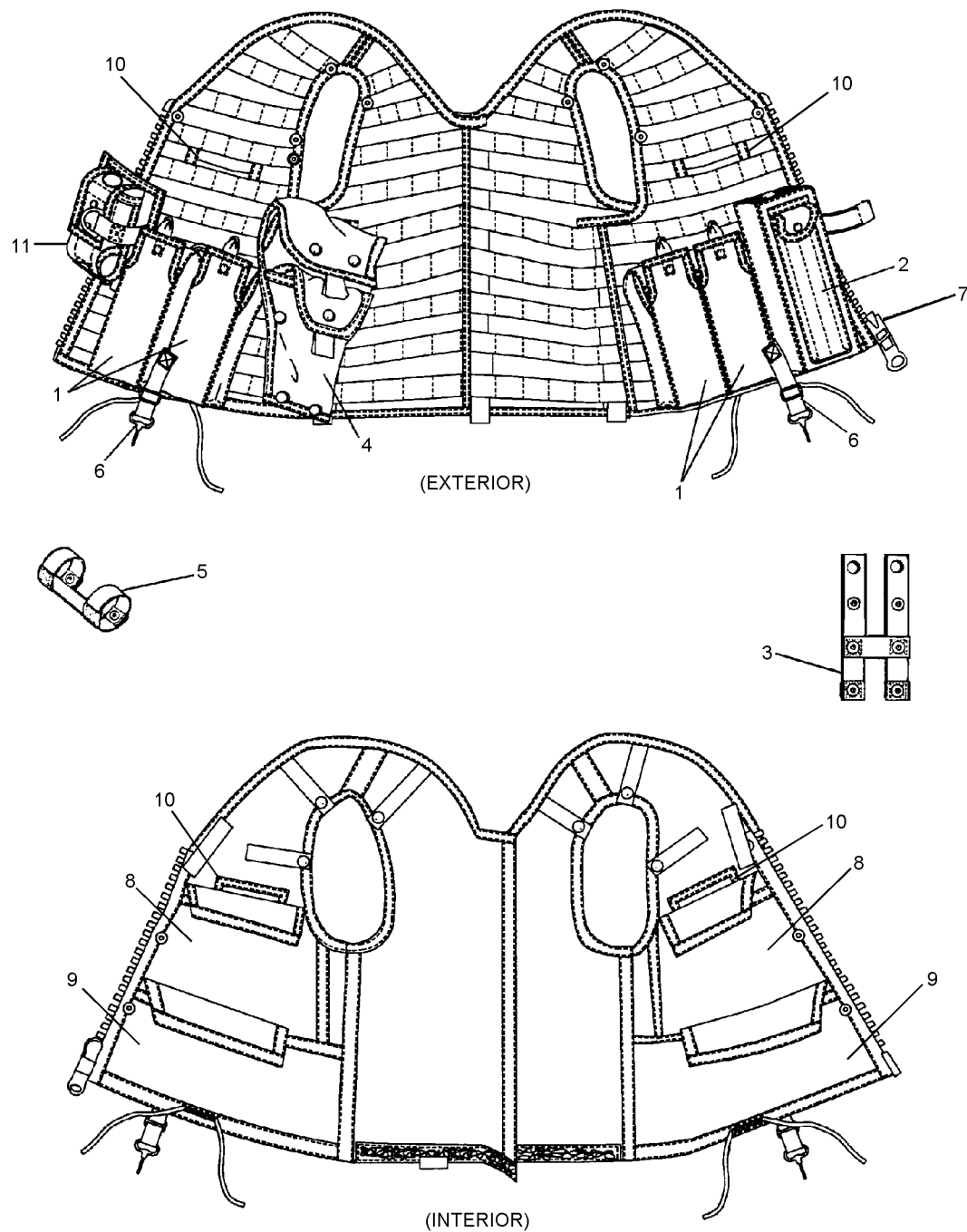


(INTERIOR)

- | | |
|-----------------------------------|---|
| 14. INSIDE POCKETS (WATER BAGS) | 21. FRICTION ADAPTER (CHEST) |
| 15. CHEST HARNESS | 22. FRICTION ADAPTERS (LEGS) |
| 16. LEFT LEG STRAP | 23. INSIDE POCKETS (GENERAL KIT, MEDICAL KIT) |
| 17. RIGHT LEG STRAP | 24. HARNESS KEEPERS |
| 18. CHEST STRAP CHANNELS | 25. LEG STRAP RETAINERS |
| 19. HARNESS RETAINER STRAPS | 26. LIFT STRAP |
| 20. FRONT LIFT ATTACHMENT CHANNEL | 27. FRONT LIFT ATTACHMENT LOOP |

Figure 3-1. Survival Vest CMU-33A/P22P-18(V), Type I (Sheet 2 of 2)

00300102



- | | |
|-------------------------------------|-------------------------------------|
| 1. GENERAL POCKET(4) | 7. SLIDE FASTENER |
| 2. RADIO POCKET | 8. INSIDE POCKETS (WATER BAGS) |
| 3. OXYGEN/CBR ATTACHMENT (OPTIONAL) | 9. INSIDE POCKETS (OPTIONAL ITEMS) |
| 4. PISTOL AND AMMO (OPTIONAL) | 10. TORSO HARNESS ADAPTION HOLE (2) |
| 5. FLASHLIGHT KEEPER | 11. OXYGEN REGULATOR POCKET |
| 6. TORSO ATTACHMENT (2) | |

Figure 3-2. Survival Vest, CMU-33A/P22P-18(V), Type II

003002

1. Since it is generally difficult to reach the inside stowage pockets of the vest after suiting up for flight, they should be used for items that are not required during flight. In addition to water bags, items that accommodate comfort, such as gloves, hat, food, or an emergency blanket can be stowed in the inside pockets.

2. When helicopter aircrews wear the Type I vest with the hard armor in front (figure 3-3), the slide fastener of the vest is engaged for no more than two inches at the bottom. The slide fastener must be down to that level to allow access to the front armor disconnect handle once the beaded handle has been pulled for quick removal of the armor in an emergency egress situation. Otherwise, the vest is zipped all the way up. For rapid removal in case of a crash on land, the slide fastener may be unzipped from the bottom, which will allow the Army .50 caliber armor to fall out from underneath (Section 3-3).

3. The Type I vest has a two-way plastic slide fastener on the front to allow the vest to be opened from either the top (Navy/Marine) or bottom (Army) to allow easier access for armor disconnect.

4. The Type II vest, used in ejection-seat aircraft, has a metal one-way slide fastener for increased airblast protection in the event of seat ejection.

3-12. GENERAL POCKET CONFIGURATION. Four general pockets are used on the Type I vest and three are used on the Type II vest. The remaining general pockets may be used to stow up to five pounds of other optional survival items if space is available on the vest. Each additional item shall be properly tied off and secured to the pocket securing loop in accordance with paragraph 3-22. Refer to table 3-1 for details of general purpose pocket configuration.

3-13. TYPE I SURVIVAL VEST CONFIGURATION. The Type I Vest is intended for use by aircrews of helicopters and most fixed-wing non-ejection seat aircraft (FWNES). At the aircrewmember's discretion,

pocket locations may be reconfigured and survival equipment redistributed to better fit the aircrewmember's comfort and mission requirements. Figures 3-4 and 3-5 are suggested configurations only, the only requirements being that the survival items in these figures cannot be moved from the right side of the vest to the left side of the vest and vice versa without type command approval for the Navy and as authorized by the commanding officer for the Army. Vest configurations used by the Army include the SRU-36/P, SRU-40/P and SEA underwater aircrew breathing devices, tourniquet and space blanket vice day/night flares. Refer to table 3-2 and figure 3-4 for suggested pocket/equipment placement configurations.

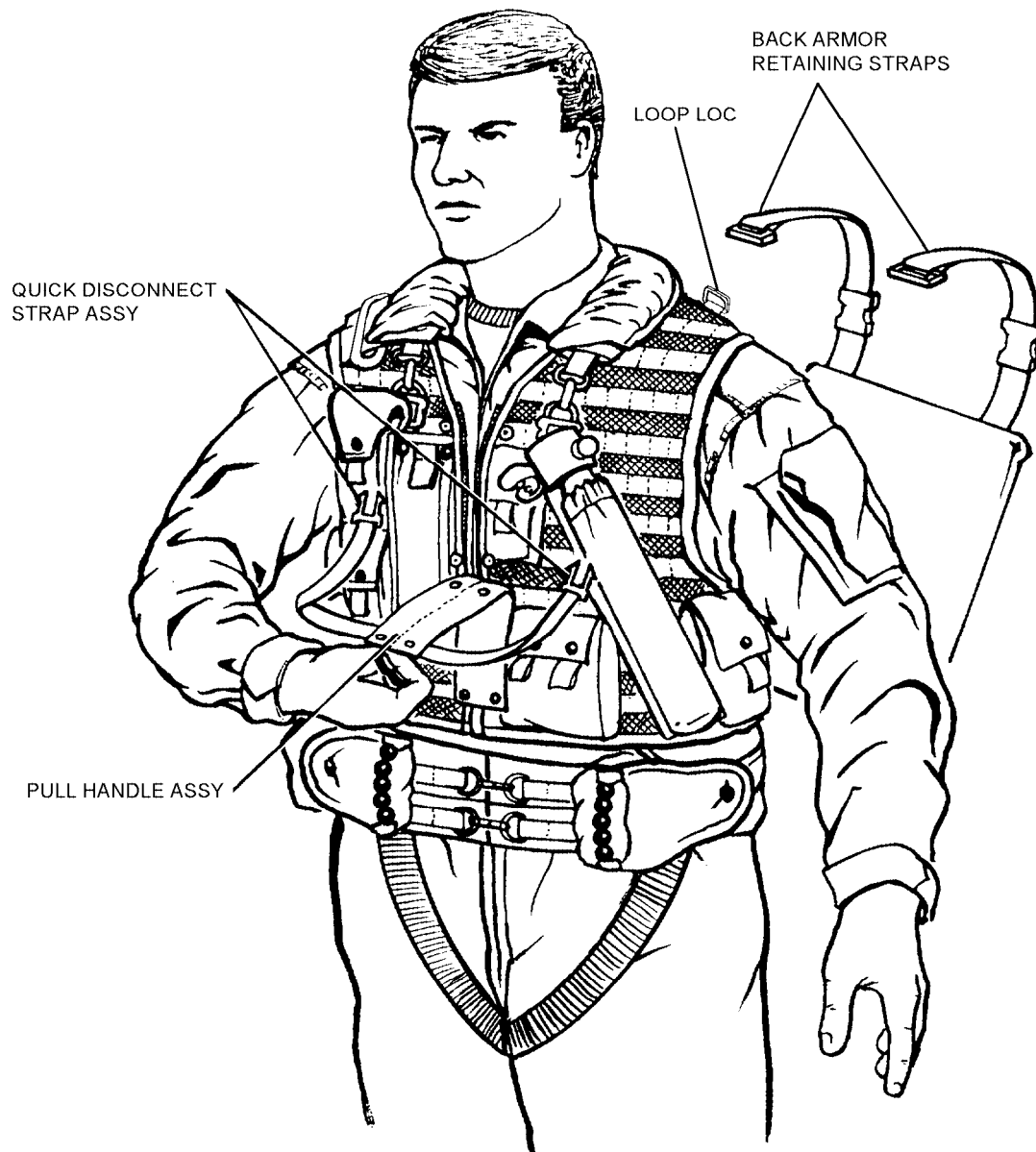
3-14. TYPE II SURVIVAL VEST CONFIGURATIONS. Refer to table 3-3 and figure 3-5 for configurations suggested for aircrewmembers who wear a torso harness. (Note that the Type II vest does not utilize a hoisting harness).

3-15. APPLICATION.

3-16. TYPE I CMU-33A/P22P-18(V) SURVIVAL VEST. The Type I vest is designed for use by all aircrews in conjunction with the aircrew armor assemblies. The attachment point for use of the body armor is located on the shoulder seam of the Type I vest. The vest may be worn with the soft and hard armor, the Army .50 caliber hard armor, only the soft armor or as a survival vest without any armor. On the Type I vest the general pocket over the radio pocket is either moved to right side or removed to make room for the Navy Helo CBR attachment to be positioned above the radio pocket (figure 3-6). The Army Helo CBR Nuclear Biological Chemical (NBC) unit is attached to the crewmember's upper left shoulder on the vest. The Army Apache configuration has the NBC unit attachment strapped to either the left or right arm. Neither of the Army NBC configurations require any modification of the Type I vest.

Table 3-1. General Purpose Pocket Configurations

General 1	General 2	General 3	General 4	General 5
Pen Flares Strobe Light	Whistle Compass Mirror Leatherman Wave Tool (if applicable) Hook Blade or Equivalent (if applicable) Emergency drinking water bottle, 4 oz	MK 124 Day/Night Distress Signal Flare (1 or 2) (Army: Substitute Space Blanket and Tourniquet for flares)	Sea Dye Marker (Type I) Optional Items (Type II)	Optional Items AN/PRC-90 (if applicable)



674-003

Figure 3-3. Type I Survival Vest With Hard Ballistic Armor

Table 3-2. Type I Survival Vest Configurations

Right Side			Left Side		
Pocket	Row	Column	Pocket	Row	Column
Flashlight Keeper	D-E	1	Radio	B-D	1-5
			HEED/HABD/SEA	B-F	5-7
Knife	A-F	2-3	Pistol/Ammo	A-E	7-10
General 1	F-H	4-5	General 5 or CBR Attachment	E-G	1-2
General 2	C-E	4-5			
General 3	C-E	6-7	Oxygen/CBR Attachment	A-C	1-2
General 4	C-E	8-9			

- Notes:
1. LPU-21/P Collar Lobe Attachments are on row H in column 2 of vest right and left sides.
 2. Inside pockets contain SRU-31/P or alternate SRU-31A/P, and ground air emergency code card.
 3. Hand-Held Penlight (as required) is stowed in radio pocket or any general pocket.
 4. Knife Pocket, Radio Pocket, and Flashlight Keeper not utilized by V-22. Oxygen Attachment utilized only by V-22.
 5. While wearing the leather shoulder holster in lieu of the pistol/ammo pocket, the wearer must wear the holster under the vest. If wearing body armor, the holster must be worn over the soft armor but under the vest.

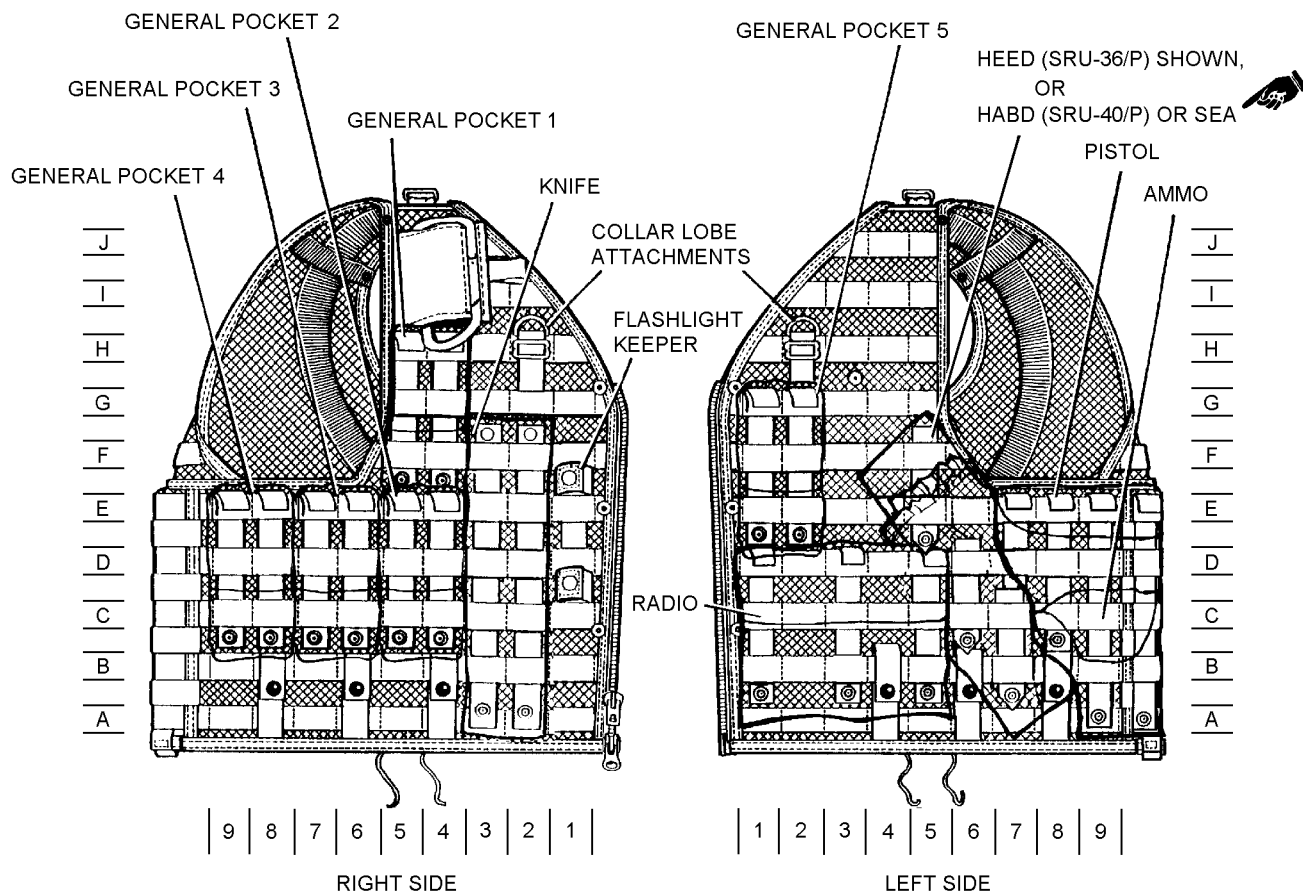


Figure 3-4. CMU-33A/P22P-18(V) Survival Vest, Type I, Configuration Diagram

003004

Table 3-3. Type II Survival Vest Configurations

Right Side			Left Side		
Pocket	Row	Column	Pocket	Row	Column
Flashlight Keeper (Note 4)	B-C	1	General 3	A-C	2-3
General 1	A-C	7-8	Pistol/Ammo (Note 4)	A-E	8-11
General 2	A-C	5-6	CBR Attachment (Note 4)	E-G	1-2
Oxygen Pocket Secure Strap	D-E	1	Oxygen Regulator (E-2C/TACAIR) Pocket	C-E	1
Radio	A-E	2-3	HABD (Note 4)	E-F	5-7
Knife (Note 4)	*	*	General 4	A-C	5-6

- Notes:
1. LPU-23/P Collar Lobes Attachments are on row H in column 2 of vest right and left sides.
 2. LPU-36/P - Torso Attachment Straps are on rows A thru C in column 4 of vest right and left sides.
 3. Torso Harness Parachute Riser Attachment Slots are between rows F thru G on columns 2 thru 4 on vest right and left sides.
 4. Optional Items.
 5. While wearing the leather shoulder holster in lieu of the soft pistol/ammo pocket, the leather shoulder holster must be worn over the torso harness but under the vest.

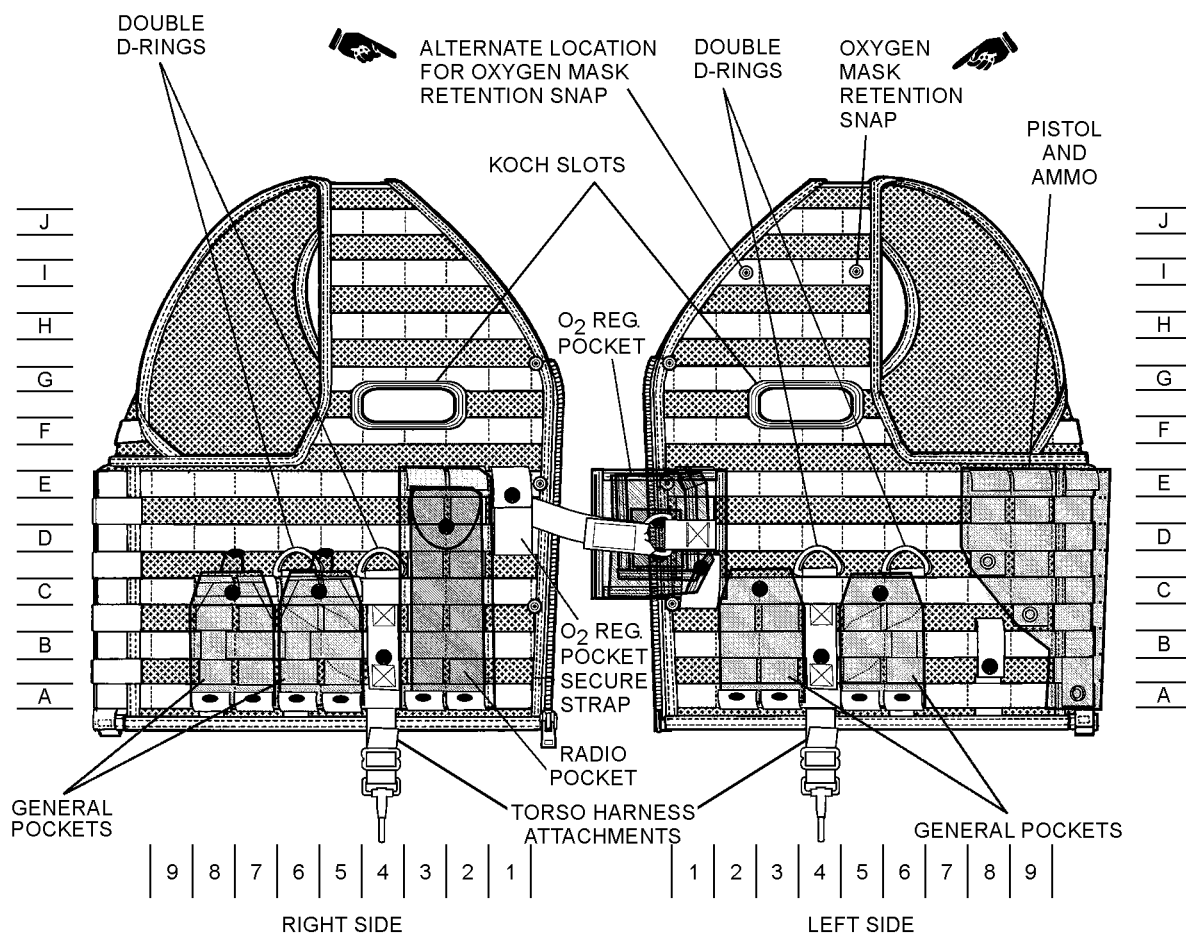


Figure 3-5. CMU-33A/P22P-18(V) Survival Vest, Type II, Configuration Diagram

003005

3-17. For Army over-land missions, the hoisting harness of the Type I vest can be used as a gunner's belt. Pull the snap link out of its placement flap on the right shoulder, so strap comes out of the center of the back, and attach to the aircraft. The Army may use this configuration as a replacement for their current "monkey harness" in flights over land.

3-18. TYPE II CMU-33A/P22P-18(V) SURVIVAL VEST. The Type II configuration of the vest does not

include the hoisting harness. The Type II vest is worn over the PCU-33 or PCU-56 torso harness and attaches to the harness. The torso harness (PCU-33 or PCU-56) attaches to the vest using snaphooks on the vest and D-rings on the harness in the same manner as the SV-2B survival vest when using the LPU-23/P Life Preserver.

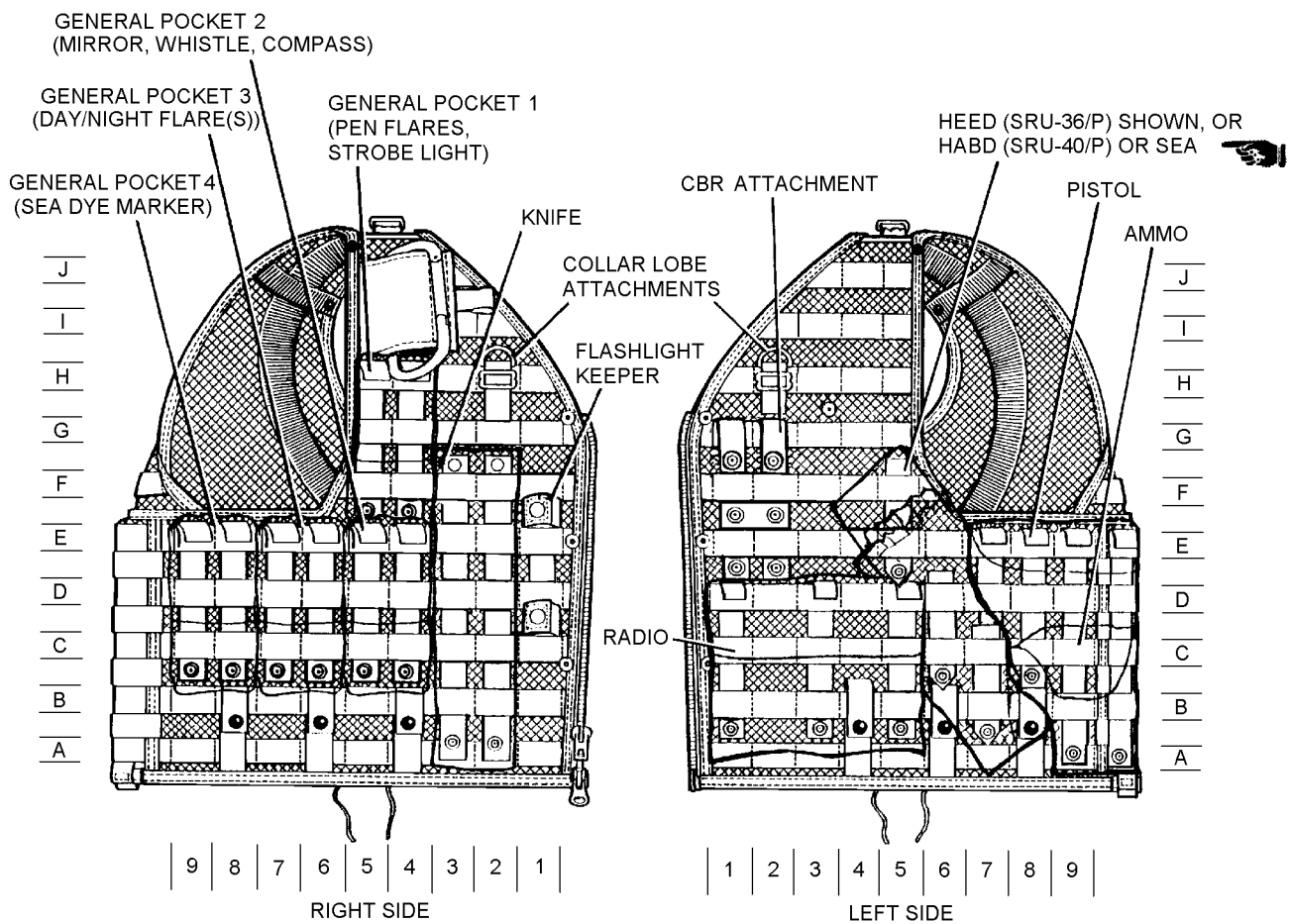


Figure 3-6. CMU-33A/P22P-18(V) Survival Vest, Type I, Configuration Diagram With Navy CBR Attachment

003006

3-19. FITTING.

3-20. The CMU-33A/P22P-18(V) Survival Vest is worn with the aircrew armor assembly, standard military personal equipment, and the appropriate life preserver. The vest comes in only one size but can be adjusted to fit individuals of various size and structure. There are three areas where adjustments may be made; the center of the back and under each arm. Primary adjustment should be made at the back-center followed by under-arm adjustments to refine the fitting. When fitting the survival vest ensure that the aircrew member being fitted is wearing the appropriate flight equipment (applicable anti-exposure garments, flight suit, anti-g suit, armor, and torso harness). All adjustment points on the vest should be at their outer-most limits. To fit the vest proceed as follows:

NOTE

When fitting the Type I vest, ensure the removable hoisting harness is installed.

Materials Required

Quantity	Description	Reference Number
As Required	Pile Tape, 1 inch	MIL-F-21840 NIIN 00-106-5974
As Required	Hook Tape, 1 inch	MIL-F-21840 NIIN 00-106-5973
As Required	Thread, Nylon, Size E	V-T-295 NIIN 00-204-3884
As Required	Thread, Nylon, 6 cord	V-T-295 NIIN 00-204-3749

1. Have the individual don the vest and engage the slide fastener.

2. Remove the insertion strap from the back-center of the vest (figure 3-7). This will separate the vest in back.

3. Overlap the left back panel over the right panel until a comfortable fit is obtained around the upper chest area. Thread the insertion strap through the nearest loop which allows the selected fit to be maintained.

4. Pull the bottom portion of the panels together to achieve a proper fit around the torso. Using a suitable marker, mark the right panel where the edge

of the left panel overlaps the right panel. Have the individual remove the vest ensuring that the insertion strap does not come out of the top loop.

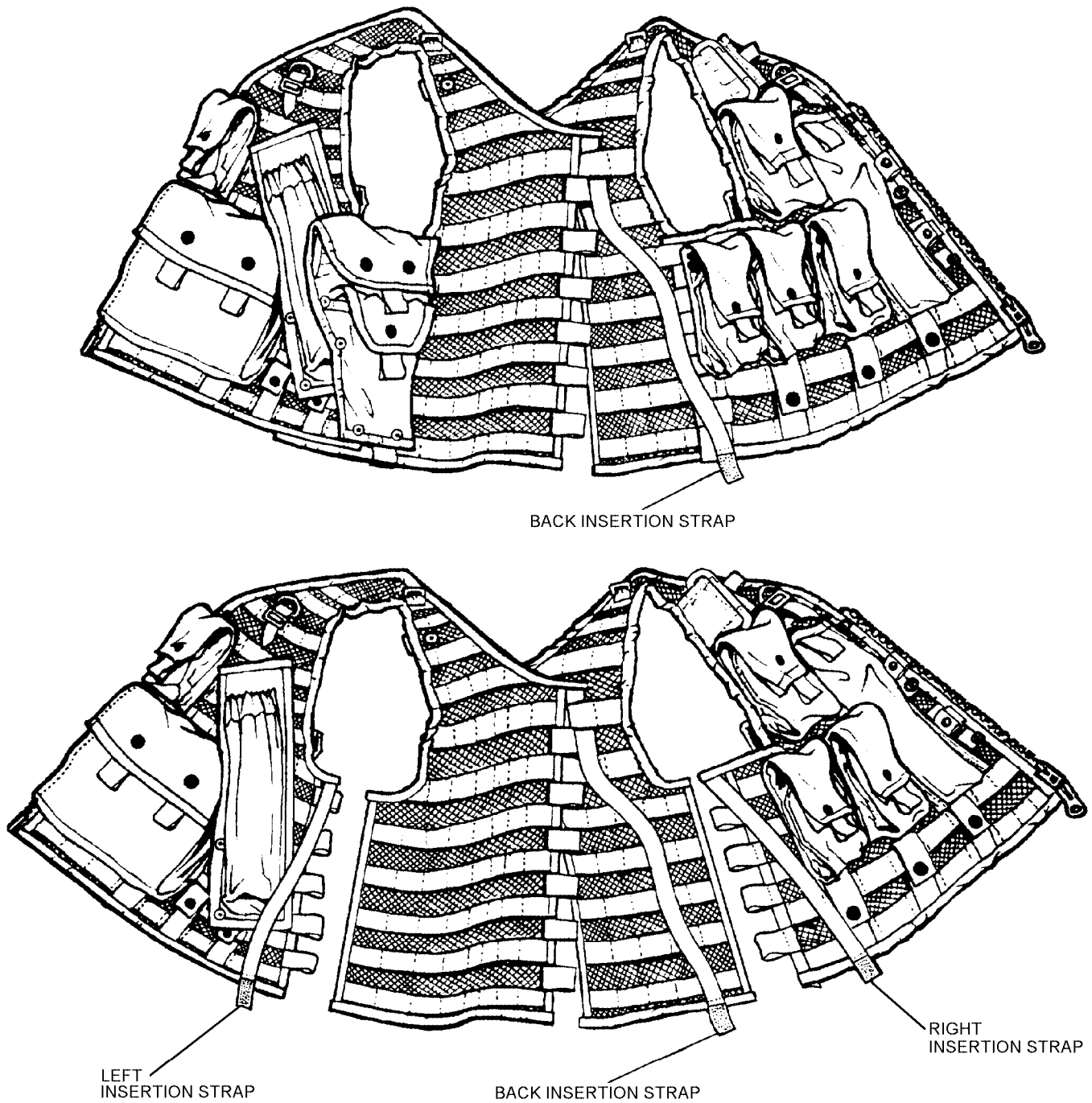
5. Lay the vest on a work bench with the inside facing down. Overlap the panels and align the left edge with the marked position on the right panel. Note the amount of overlap. If the overlap covers four or more loops at any point, the vest should be adjusted inward evenly under each arm. The under-arm adjustment is necessary to avoid excessive bunching of material at the back and to maintain symmetry. Once the under arm adjustments have been made, have the individual don the vest and remark the overlap. Interlace the insertion strap vertically straight up and down through the remaining loops.

6. If the individual is broad shouldered, the vest may be adjusted diagonally to taper the fit. As the insertion strap is interlaced, it may be moved over successive loops or interlaced through two loops, then moved over to the adjacent loop and interlaced through two more loops vertically. Loops may be skipped in order to avoid bunching of material. Any other combination may be used if necessary to maintain alignment with the mark on the right panel. If the overlap is excessive at the back, use the underarm adjustments to compensate.

7. When fitting the Type II vest, it is imperative to properly fit the vest cut outs to the canopy release adapters. With the aircrewmember in a seated position, ensure the parachute's canopy release adapters can be attached to the male Koch fittings without catching the survival vest material between the two pieces of hardware. If the material is being caught and preventing the Koch fittings from fully latching, it is necessary to use S-folds that will remove the vertical slack in the vest material while the aircrewmember is in a seated position.

NOTE

Steps 3 thru 4 shall be used for fitting the CMU-33A/P22P-18(V) survival vest to aircrew. It is not recommended to have the LPU series life preserver or any of the survival item stowage pockets mounted on the vest during fitting. All machine stitching shall be in accordance with ASTM-D-6193, type 301 lockstitch, using 7 to 10 stitches per inch with a minimum back or overstretch of 3/4 inch unless otherwise specified.



674-007

Figure 3-7. Fitting Adjustment, Survival Vest

8. Aircrew may require the vest panel to overlap both the rear and right side panel of the vest. The upper and lower edge corners of all overlapped panels (both inside and outside) shall be tacked using two turns of waxed size E nylon thread, doubled. Thread tacking shall pass through all layers of the panels edge binding tape and be tied off using a surgeon's knot followed by a square knot and a binder's knot. The tacking shall be $1/4 \pm 1/16$ inch from the edge of the panel fabric and pass through the binding tapes only.



3p20s8

Step 8 - Para 3-20

NOTE

If overlapping the panels places the edge binding tapes from each panel out of line with each other, the tackings may be made by tacking through the edge binding tape of the top overlapping panel and through the 1" attachment webbing on the underlying panel. Never make a tacking through the Raschel knit fabric of the survival vest.

9. A formed fit in the shoulder and chest areas may be required. To accomplish a formed fit and take out any slack in the shoulder and chest area, S-folds shall be created in the back of the vest below the loop locs and above the insertion strap or loop.

NOTE

S-folds shall be made from the loop loc toward the back of the vest. The pleat formed by the fold should be made away from the head of the wearer, creating the thinnest possible fold for ease of sewing.

Prior to marking shoulder for form fitting S-folds, have aircrewmember lift vest by bottom of mesh fabric high enough to en-

sure vest will not cover lapbelt releases while seated.

10. S-folds shall be formed by measuring 3 inches and making 4 marks (each end and 1 and 2 inch marks) on the edge of the vest. Fold the third mark to the first and the last mark to the second to form the S-fold. Ensure the pleat formed by the fold is made away from the head of the wearer, creating the thinnest possible fold.

NOTE

A total of two S-folds are authorized. One on each side shoulder between the first and second webbing loop from the top of the shoulder on the back. If the vest balloons around the front neckline, darts may be created by S-folding the inside seam edges (above the slide fastener) no more than 1 inch total, in order to remove excess slack. S-fold is secured in place with 3-inch x 1-inch box stitch, 1/8 inch from the edge, overstitched 1 inch. In extreme cases, additional S-folds are authorized on the back of the vest above the neckline. After making S-folds, or in vests without S-folds, the harness keeper's pull-the-dot snaps may interfere with S-folds or create hot spots on pressure sensitive areas around the aircrewmember's collar bone area. In these instances, the snaps and keepers may be moved up or down one inch, taking care to ensure they are reset into the edge binding tape.

CAUTION

It may be necessary to hand walk machine to avoid needle breakage.

11. Sew the S-folds made in steps 9 and 10 with a 3-inch x 1-inch box stitch, 1/8 inch from the edge, overstitched 1 inch.

NOTE

With the vest properly donned, ensure proper webbing length is maintained to accommodate body armor and all flight clothing conditions worn prior to shortening chest strap webbing.

12. Mark the chest strap webbing 1 inch from the friction bar on the under side of the free end and the outside of webbing against the body. Make another mark 10 inches from the friction bar and sear cut the excess webbing at the 10 inch mark.

13. Cut a 1-inch by 4-inch length of hook fastener tape and a 1-inch by 4-inch length of pile fastener tape.

14. Pile fastener tape shall be positioned on the under side of the free end of the webbing running from the 1-inch mark made in step 12 toward the outside of the free end of webbing.

15. Secure the pile fastener tape to the free end of the webbing using 1 row of stitching 1/8 +1/16 -0 inch from all edges of pile fastener tape and webbing.

16. Secure the hook fastener tape to the webbing at the 1-inch mark made in step 12 toward the outside of the wearer's body, using 1 row of stitching 1/8 +1/16 -0 inch from all edges of hook fastener tape and webbing.

17. Fold webbing cut in 12 back on itself 1 3/4 inches to form a triangle, and sew a single row of stitches 1/8 inch from edges of triangle.

18. With vest properly donned, mark the free end of leg strap webbing under side 1 inch from friction bar.

19. Mark leg strap webbing on wearer's body on the outside of webbing 1 inch from friction bar.

20. Excessive leg strap webbing may be shortened to no less than 10 inches from the friction bar.

NOTE

Ensure proper webbing length is maintained to accommodate body armor and all flight clothing conditions worn prior to shortening leg strap webbing. Mark the leg strap webbing 10 inches from the free end and sear cut the excess webbing.

Once the leg strap is shortened, the hoisting harness will not fit large body types. If it is necessary to re-fit the hoisting harness on a large frame individual, a new harness must be fabricated.

21. Cut a 1-inch by 4-inch length of hook fastener tape and a 1-inch by 4-inch length of pile fastener tape.

22. Secure the pile tape to the underside of the webbing at the 1-inch mark made in step 18, position the pile tape from 1-inch mark centered on the webbing lengthwise toward the free end of the webbing, using 1 row of stitching 1/8 +1/16 -0 inch on the webbing.

23. Secure the hook tape to the outside of the webbing at the 1-inch mark made in step 19, position hook tape from the 1-inch mark centered on the web-

bing lengthwise, using 1 row of stitching 1/8 +1/16 -0 inch on the webbing.

24. Fold webbing cut in step 20 back on itself 1 inch and sew in place using a 1 1/2 by 3/4-inch box stitch.

25. Lay the vest on flat surface with inside facing up and route the right lift attachment loop upwards and between the Raschel mesh fabric and the right shoulder strap. This should place the lift loops under the shoulder strap and just beneath the middle harness keeper.

26. Tack each side of the lift loop webbing to the shoulder strap using two turns of waxed, three cord, single thread on each side of the webbing. Place tacking 1/2 inch below loop and tie off using a surgeon's knot, followed by a square knot and binder's knot. Repeat procedures on left side.

NOTE

Harnesses previously placed in service with the lift loops removed are considered serviceable until further notice.

3-20A. INSTALLATION OF THE EXPANSION PANEL AND QUICK ADJUSTMENT STRAPS. The expansion panel and quick adjustment straps (figure 3-7A) may be installed as needed on either the Type I or Type II survival vest for customizing the hard to fit aircrewmember and aircrewmembers who wear anti-exposure ensembles or those who wear body armor.

Materials Required

Quantity	Description	Reference Number
1	Expansion Panel	3561AS320 NIIN 01-497-8610
As Required	Adjustment Strap	3561AS321 NIIN 01-497-8616
As Required	Thread, Nylon, 3 Cord	V-T-295 NIIN 00-559-5212

NOTE

Two or more quick adjustment straps may be utilized as needed on a case-by-case basis.

1. Lay the vest on a work bench with the inside facing down. Unweave the back insertion strap from the right rear panel of the survival vest.

2. Determine the amount of adjustment needed for the flight clothing the aircrewmember will wear and fit in accordance with paragraph 3-20.

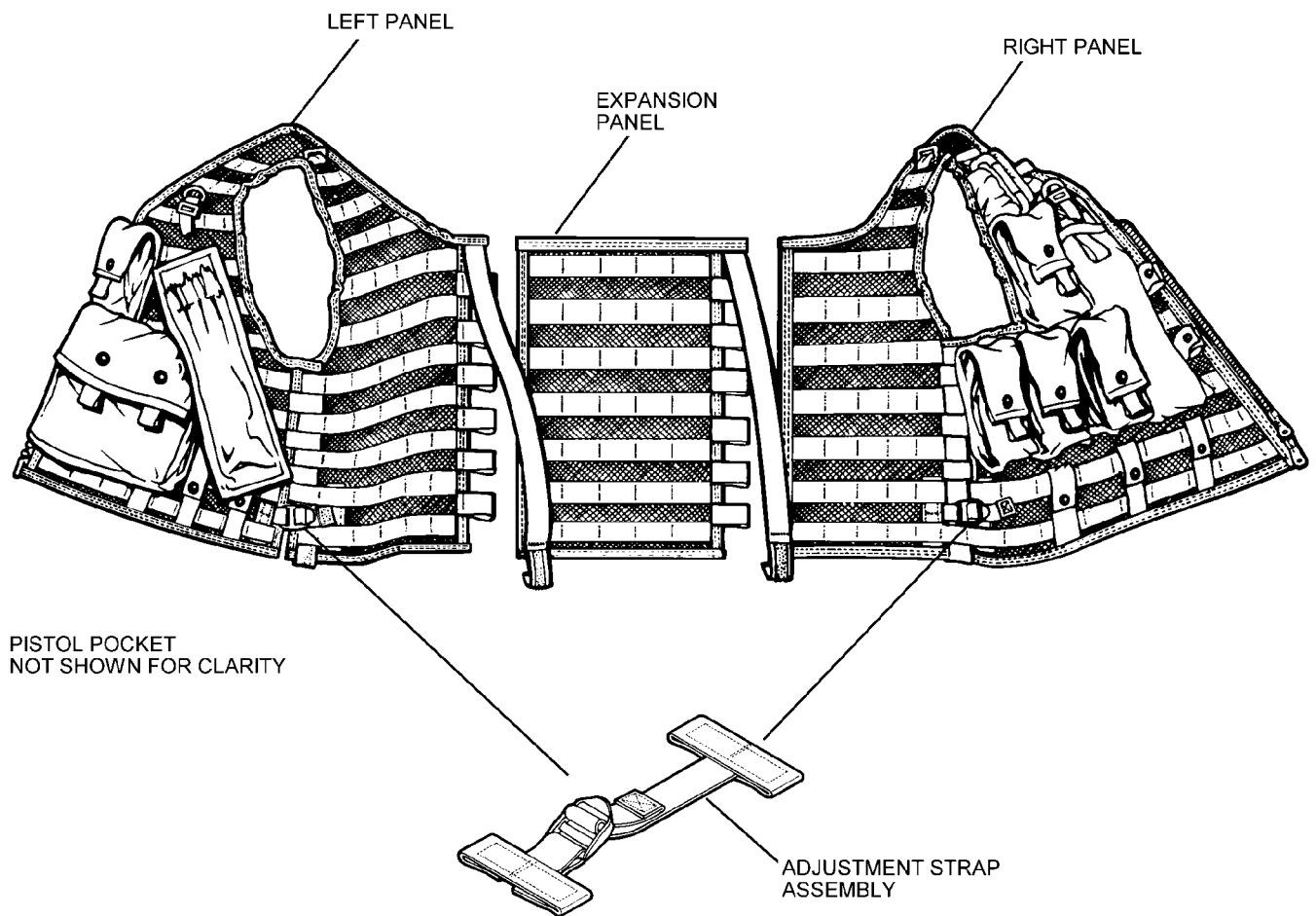


Figure 3-7A. Expansion Panel and Adjuster Strap(s)

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- 3. After the desired size has been determined, weave the expansion panel's insertion strap through the attachment loops on the rear panel of the vest. Ensure the expansion panel overlaps the right and left vest panels evenly before weaving the vest's back insertion strap through the attachment loops of the expansion panel.
- 4. All final adjustments will be taken in equally from both sides, using the left and right under arm adjustments to make the final fit as close as possible.
- 5. All overlaps of the panels shall be tacked in accordance with paragraph 3-20, step 8.

NOTE

Two or more quick adjustment straps may be used to take up slack in vest adjustment after the expansion panel has been installed. When cold weather clothing or armor is donned, the aircrew can quickly let the adjusters out as needed, or on a daily basis, they can be used to enhance custom fitting of the vest. To accommodate fit, the LPU-27/P, LPU-34/P, LPU-35/P, LPU-36/P or LPU-37/P life preservers may be used in place of the LPU-21/P or LPU-23/P life preservers.

If the chest or leg straps have previously been shortened during fitting procedures and are not long enough after installing the expansion panel, new straps can be fabricated in accordance with paragraph 3-37.

3-21. RIGGING AND PACKING.

3-22. Refer to NAVAIR 13-1-6.7 Series or TM 55-1680-317-23&P for survival items to be stowed in the CMU-33A/P22P-18(V) Survival Vest. Figures 3-4, 3-5, and 3-6 are suggested configurations. At the aircrewmember's discretion, pocket locations and survival items may be reconfigured to better fit the aircrewmember's comfort and mission requirements. Figures 3-4 and 3-5 are suggested configurations only. The only requirements being that the survival items in these figures cannot be moved from the right side of the vest to the left side of the vest and vice versa without type command approval for the Navy and as authorized by the commanding officer for the Army. Figures 3-1 and 3-2 illustrate provisions made for a survival radio, knife, and five general purpose pockets; all located on the outside of the vest. The general purpose pockets, which are all the same size, provide space for a strobe light and hook blade knife (if applicable), pencil flares, compass, mirror, whistle, day/night flares or tourniquet and space blanket, a sea dye marker, or optional items. Additional pockets for optional items, which do not come with the Survival Vest, and therefore must be ordered from supply separately, are the pistol/ammo pocket, the HEED/HABD

(SRU-36/P or SRU-40/P) pocket and the knife pocket for the Type II vest. The inside pockets of the vest are for items not normally required during flight such as water bags, general survival kit, medical kit (such as SRU-31/P), and chemical lights. Additional optional items which come with the vest are a flashlight keeper, CBR/Oxygen attachment (Type I), LPU-21/P and LPU-23/P collar lobe attachment straps, knife pocket, and torso harness attachment straps (for Type II vest). These items are provided on an initial issue basis. If lost or damaged they must be fabricated at the local level in accordance with instructions provided in (table 3-4). Rig and pack the CMU-33A/P22P-18(V) Survival Vest as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Cord, Nylon, Type I (with core strands removed) or Type IA (coreless)	MIL-C-5040 NIIN 00-240-2154
As Required	Rubber Bands	NIIN 00-292-9920 or NIIN 00-531-2813
As Required	Thread, Nylon, Size E	V-T-295 NIIN 00-204-3884
As Required	Webbing, Nylon, 1-Inch Yellow/Green, CL 1, 1A, or 2	MIL-W-4088 NIIN 00-262-1643
As Required	Tape, Packaging, 2-Inch	NIIN 00-266-5016
As Required	Bag, Plastic	NIIN 00-837-7757

WARNING

Additional survival items may be added to the CMU-33A/P22P-18(V) Survival Vest at the discretion of the aircrewmember. However, no items shall be added which will cause the total weight of the added items to exceed five pounds. Each additional item shall be secured in the pocket in which it is stowed by a 48-inch length of nylon cord in accordance with step 2. All items shall be stowed in a manner which will maintain an equal weight balance of the vest (see OPNAVINST 3710.7 or Department of the Army Regulation (AR) 95-3) and in such a manner which will not affect the movement of flight controls and other operating procedures.

NOTE

If weapon is to be carried, use the Airsave Soft Pistol/Ammo Pocket (NIIN 01-441-3299) as the primary means to carry the 9mm pistol or as an alternate, the

Black Leather Shoulder Holster, (P/N 7791527, NIIN 00-973-2353).

1. Ensure all survival equipment has been inspected in accordance with NAVAIR 13-1-6.5/AR 95-3.

Table 3-4. Vest Repairs/Fabrications/Replacements

Description of Repair or Replacement	Paragraph Number
Replacement of loose or broken stitching	Not E1
Repair of small holes or tears	Not E1
Replacement of hook and pile fastener tapes	Not E2
Replacement of snap fasteners	Not E3
Installation of Expansion Panel and Quick Fit Adjusters	3-20A
Repair of Vest Webbing	3-33A
Repair of Vest Harness Keeper	3-33B
Repair of Raschel Knit Nylon Mesh	3-33C
Repair/Replacement of LPU-21/P and LPU-23/P Collar Lobe Attachment Strap	3-34
Attachment of the SRU-40/P Helicopter Aircrew Breathing Device (HABD and SEA) Mouthpiece Cover	3-34A
Repair/Replacement of Survival Vest Waist Belt Loops	3-35
Repair/Replacement of Type I Vest Looplocs	3-36
Repair/Replacement of Hoisting Harness	3-37
Installation of Leg Strap Quick Release Fittings	3-37A
Repair/Replacement of Modular Pockets	3-38
Repair of Knife Pocket	3-38A
Repair of Survival Vest and Modular Pockets Attachment Cord	3-38B
Fabrication of the Survivor's Retaining Line	3-38C
Fabrication/Replacement of Flashlight Keeper	3-39
Fabrication Procedures/Vertical Attachment Modification of the HABD/SEA Pocket	3-40
Wearing the Leather Shoulder Holster with the Type I and Type II Survival Vests	3-41
Fabrication of the V-22 CRU-103/P Oxygen Regulator Pocket	3-41A
Fabrication/Repair/CBR Attachment	3-42
Fabrication/Repair of Oxygen Hose Retaining Strap, Type II Vest	3-43
Relocation of the Oxygen Mask Retention Snap	3-43A
Repair/Replacement of Slide Fastener	3-44
Fabrication of Torso Attachment for LPU-23/P only	3-46
Fabrication Procedures for the LPU-36/P Flotation Collar Attachment Straps	3-46A

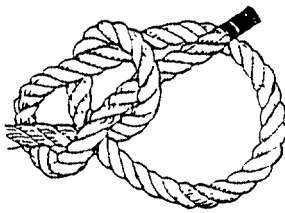
Table 3-4. Vest Repairs/Fabrications/Replacements (Cont)

Description of Repair or Replacement	Paragraph Number
Fabrication of Waist Lobe Attachment for LPU-21D/P and LPU-35/P only	3-47
LPU-21/P and LPU-23/P Attachment	3-48
LPU-34/P and LPU-37/P LPFC Attachment	3-49
LPU-36/P LPFC Attachment	3-50
Modification for Accommodation of a Hands-Free Hydration System	3-50A
Modification for Conflicting Fits with the Counter Pressure Vest	3-50B
Modification for Installation of Joint Helmet Mounted Cueing System (JHMCS), QD Bracket Access	3-50C
Integration of the Type II Survival Vest to the Integrated Torso Harness Assembly	3-50D
Fabrication/Repair of Pull Handle	3-84
Fabrication/Repair of Quick Disconnect Strap Assembly	3-85
Fabrication/Repair of Back Hard Armor Retaining Strap	3-86
Repair/Replacement of Back Hard Armor Support Strap	3-87
Notes: 1. Broken or loose stitching shall be repaired by restitching using stitch Type 301, 8 to 10 stitches per inch, with thread conforming to MIL-T-83193, olive green or V-T-295, Size E, olive green. Backstitch 1/2 inch on all ends of stitching. 2. Worn or damaged hook and pile fastener tapes may be repaired using the same type and length of fastener tape. Remove damaged tape and stitch new tape in position of original tape, using a single row of stitching 1/8 inch from all edges, stitch Type 301, 8 to 10 stitches per inch, with thread conforming to V-T-295, Size E, olive green. 3. Replace broken or missing snap fastener devices using the same type of snap fastener. Refer to the applicable paragraph for correct procedures.	

2. Lay out vest and survival items on clean table.

a. Ensure stowage pockets are securely attached; all straps are interlaced to the vest and all snaps are engaged (figures 3-1, 3-2, 3-3, 3-4, 3-5 and 3-6).

b. Unless otherwise specified, all items shall be secured to the loop inside the pocket in which they are stowed using a 48-inch length of nylon cord and bowline knot. Sear cut ends of cord to prevent fraying. Fake remaining length of the cord, secure with lightweight rubber band, and stow in pocket with survival item.



Step 2b - Para 3-22

674-009

3. Attach SDU-5/E Distress Strobe Light as follows (U.S. Army refer to TM 55-1680-322-12):

a. Sear cut two 25-inch lengths of 1 inch nylon webbing.

b. Pass end of one length of webbing through slot on strobe light. Fold the length of webbing in half and align ends. Sew folded lengths together starting across webbing as close to slot as possible and continue around webbing staying 1/8 inch from edge. Repeat procedure with other length of webbing in other slot of strobe light.

c. Join webbing from both strobe light slots together and align ends. Sew together using a 3/4 X 3 1/2-inch crossbox stitch 1/8 inch from end.

d. Measure and mark 4 3/8 inches from end of joined webbing. Sew two rows of stitching across webbing at measured mark.

e. Sear a 5/8-inch hole in webbing 3 7/8 inches from the end.

NOTE

Ensure plastic switch protection cap is removed from activation switch of strobe light (SDU-5/E).

f. Cut 48-inch length of nylon cord. Pass one end through one of the slots of the strobe light and secure using bowline knot. Attach other end to loop in stowage pocket and secure with bowline knot.

g. Stow light in pocket with dome end down.

h. Allow lanyard to extend from pocket. Place seared hole in lanyard over appropriate snap and close pocket.

4. Fabricate SDU-39/N Distress Strobe Light lanyard as follows:

a. Sear cut a 16 1/2-inch length of 1-inch nylon webbing.

b. Fold webbing in half aligning ends. Sew together 1/2 inch from folded end and all around length of webbing 1/8 inch from the edge.

c. Sew a 3/4 X 3 1/2-inch boxstitch 1/8 inch from seared end.

d. Measure 4 3/8 inches from seared end and mark. Sew two rows of stitches across webbing at mark.

e. Sear a 5/8-inch hole 3 7/8 inches from seared end.

f. Pass a length of Type I nylon cord through the hole at the base of the distress light ON/OFF switch and through the loop at the webbing fold.

g. Tie ends of cord together with an overhand knot leaving enough slack in the cord to allow 1/2 to 1 inch distance between the webbing loop and base of light. Sear cut excess cord 1 inch from knot.

NAVAIR 13-1-6.7-4

h. Pass one end of 48-inch length of Type I nylon cord through the loop attaching the lanyard to the light and secure with a bowline knot. Attach other end of cord to the loop inside the stowage pocket and secure using a bowline knot.

i. Install light in pocket with dome end down. Fake excess nylon cord together, secure with light rubber band, and stow in pocket with light.

j. Allow lanyard to extend from pocket. Place seared hole in lanyard over appropriate snap fastener and close pocket.

5. The radio pockets that come with both the Type I and Type II vests are constructed to hold the AN/PRC-90, AN/PRC-90-2, AN/PRC-112(V), AN/PRC-149 and the AN/PRQ-7 Survival Radios. To install these radios, tie a 48-inch length of nylon cord to radio and secure opposite end to loop inside stowage pocket using a bowline knot.

a. Ensure radio volume control is set at maximum output.

b. Loop radio antenna and secure it to radio with rubber band. Install radio in pocket.

NOTE

The PRC-90-2 antenna is equipped with a clip and does not require a rubber band.

c. If AN/PRC-112(V) or AN/PRC-112B Survival Radios are used, install as follows:

NOTE

Steps d through k apply to AN/PRC-112B radios only. AN/PRC-112(V) radios do not require use of this plate.

d. Cut 1 X 2 3/8-inch (+1/8 inch, -0 inch) plate from any grade aluminum 0.090 (± 0.010 inch) thick.

e. Radius corners and deburr edges.

f. Cut two 2 3/8-inch lengths of 3/4-inch duct tape. Center one length of tape lengthwise along one 2 3/8-inch side of the plate and the other length of tape lengthwise along the other side of plate. Fold tapes over edges onto plate.

g. Cut two 1-inch lengths of 3/4-inch duct tape. Center one of the 1-inch tapes lengthwise along each on the 1-inch ends of the plate and fold over onto the plate.

h. Cut a 6 1/2-inch length of 1-inch duct tape. Fold one end of the tape back on itself 1 inch to form a pull tab.

i. Place tape cut in step h on flat surface with adhesive side up and folded pull-tab end to the right. Measure in 2 inches from the right end of the tape and place the plate made in steps d through g on the tape to the left of the 2-inch measured point. (There will be open adhesive areas of tape on each side of the plate.)

NOTE

Do not cover antenna with tape.

j. Place PRC-112 Series radio on work bench with buttons facing up and the word talk closest to the technician. Place the plate, prepared in preceding steps, over the buttons with the folded end of the tape on the right side of the radio just below the push-to-talk button. Fold the tape over and press it to the right side of the radio body.

k. Fold tape on the left side over and press it to the left side of the radio body.

l. Cut a 48-inch length of Type I, nylon cord and sear ends.

m. Secure one end of the nylon cord to the grommet in the survival vest radio pocket forming a 2-inch loop around the grommet and tie off using a bowline knot.

n. Secure the other end of the nylon cord to the PRC-112 Series radio webbing or V-ring using a 2-inch loop around the webbing or V-ring and tie off using a bowline knot.

o. Double bag the PRC-112 Series radios in two 12 X 24-inch ziplock plastic bags, NIIN 00-836-7757 or commercial equivalent.

p. Remove as much trapped air as possible from bag and tape over the closed ziplock closure using 2-inch duct tape.

NOTE

The Type I or IA cord can exit the bag at any point along the seal. Location of the exit point is not critical.

q. Place bagged radio into a second ziplock bag and seal closure using duct tape as in step p above.

r. Fake securing line and secure with lightweight rubber band.

s. Stow radio in radio pocket.

NOTE

Bagged radio with excessive air trapped in the bag will be difficult to stow in radio pocket. If difficulty is encountered during stowage, continue to press radio into radio pocket until sufficient air escapes to permit radio pocket flap closure.

t. Close radio pocket flap.

NOTE

Bagging of radio will not make it water proof, only water-resistant. Aircrew should not remove radio from ziplock bag until after they are in liferaft.

6. Attach illumination signal kit as follows:

WARNING

Refer to NAVAIR 11-15-7 (formerly NAV-ORD 2213) for safety precautions, handling, and storage procedures (U.S. Army refer to TB 9-1300-385 for serviceability).

a. Inspect signal kit in accordance with NAV-AIR 13-1-6.5.

b. To attach MK-79 bandolier, cut 12-inch length of nylon cord and sear ends. Tie an overhand knot in one end, pass cord end through hole provided in bandolier, and tie with a bowline knot. Tie an overhand knot in the other end of the cord, pass cord through loop in stowage pocket, then tie off with a bowline knot.

c. Cut 48-inch length of nylon cord and sear ends. Tie an overhand knot in both ends, pass one end through hole in bandolier and secure with bowline knot. Pass other end of nylon cord through end of the signal projector (pen gun) and secure with bowline knot.

d. Stow pen gun in stowage pocket ensuring pen gun is empty of flares and knurled knob is in locked position.

e. Fake excess length of nylon cord, secure with lightweight rubber band, and stow with pen gun.

7. Stow MK-13 MOD 0 (or MK-124 MOD 0) Smoke and Illumination Signal Flare as follows:

a. Cut and sear an 80-inch length of Type I/IA nylon cord and tie an overhand knot in one end.

b. Wrap end of cord two turns around end of signal flare and tie with surgeon's knot. Turns of cord shall overlap with knots snugly against each other.

c. Route cord to opposite end of signal flare and tie in same manner. Cord between ties shall be drawn tight.

d. Secure free end of cord to loop inside stowage pocket using bowline knot.

8. Fabricate lanyard for Hook Blade Knife or Hook and Snap Blade Type MC-1 as follows:

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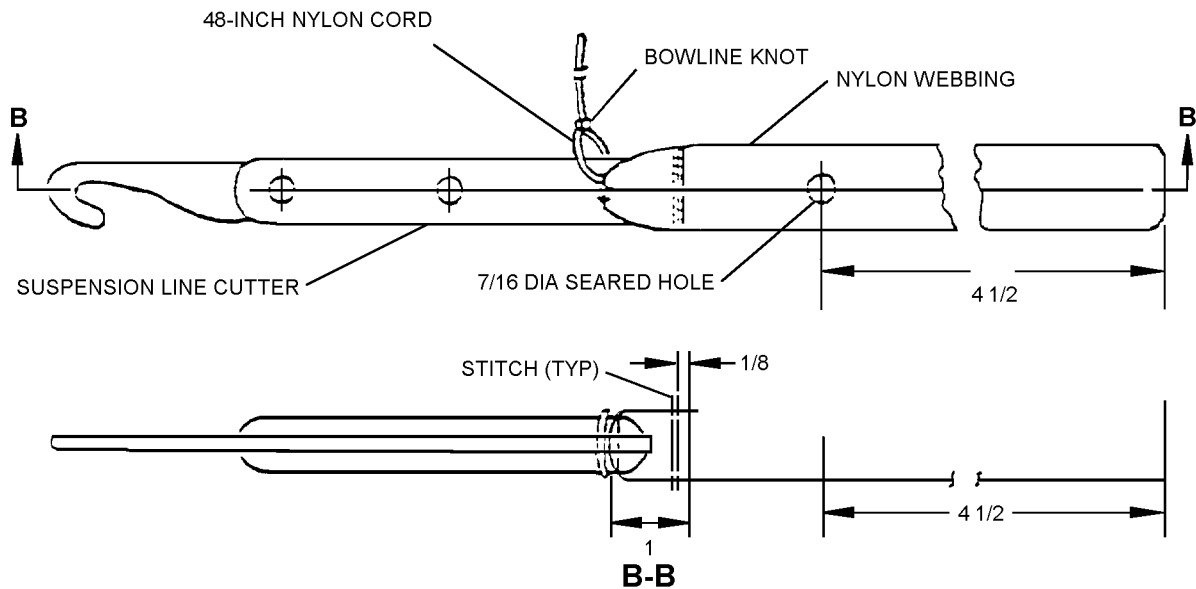
a. Cut and sear 10 1/2 length of 1 inch yellow nylon webbing and round corners of one end.

b. Sear a 7/16-inch hole 4 1/2 inches from rounded end.

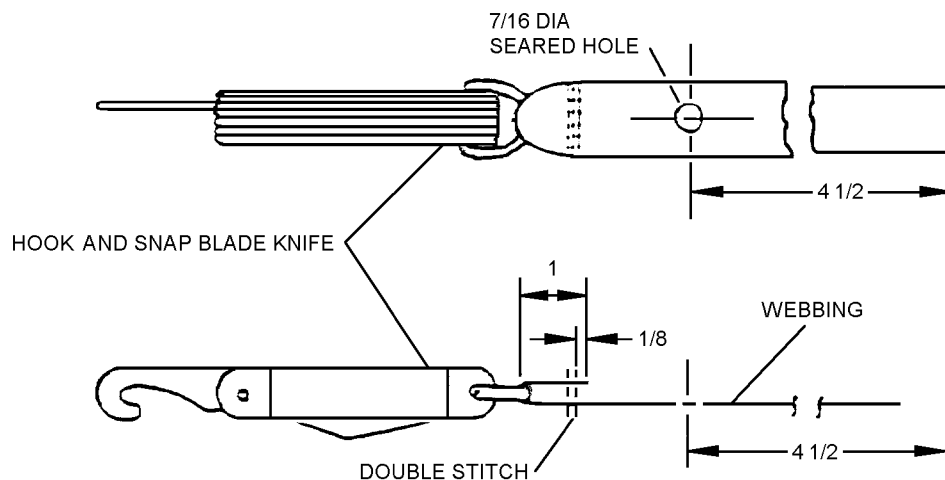
c. Thread square end through hole in hook blade knife or D-ring of hook and snap blade knife, fold over 1 inch and sew two rows of stitches 1/8 inch from seared end of webbing.

d. Cut a 48-inch length of nylon cord and sear ends. Tie a bowline knot to the shroud cutter and secure the opposite end to the attachment loop of the survival items pocket.

e. Allow lanyard to extend from pocket. Place seared hole in lanyard over appropriate snap fastener and close pocket.



HOOK BLADE KNIFE LANYARD ATTACHMENT



HOOK AND SNAP BLADE KNIFE LANYARD ATTACHMENT

Steps 8c and 8d - Para 3-22

3p22s8c

8A. For SRU-36/P, attach HEED tether line quick disconnect fitting, previously snapped to D-ring in SV-2B Survival Vest pistol pocket, to D-ring in SRU-36/P pocket, utilized with the Airsave Survival Vest. Stow HEED tether line inside pocket and install SRU-36/P into pocket. For SRU-40/P, stow bottle into bottle pocket with ballistic nylon backing and fasten hook and pile retaining strap around neck of bottle. Stow hose into pocket mounted onto bottle pocket.

9. Secure all additional survival items with 48-inch length of nylon cord and stow in pockets on vest in manner which will ensure equal weight balance of vest.

10. Ensure harness is installed into vest in accordance with [paragraph 3-37, step 7](#).

3-23. MODIFICATIONS.

3-24. There are no current directives affecting the CMU-33A/P22P-18(V) Survival Vest.

3-25. MAINTENANCE.

3-26. Repairs and other maintenance actions shall be performed at the lowest maintenance level possible except as indicated. Repair and fabrication of any part of the entire Aircrew Survival - Armor Protective Assembly is limited to those materials and procedures found in this chapter.

3-27. All stitching with size 6 thread shall be 4 to 6 stitches per inch with a 1/2-inch backstitch. Stitching with size E thread shall be 8 to 10 stitches per inch with a 1/2-inch backstitch.

3-28. All maintenance actions and inspections shall be recorded in accordance with OPNAVINST 4790.2 Series/DA Pamphlet 738-751.

3-29. INSPECTION. Required inspections of the CMU-33A/P22P-18(V) Survival Vest shall be an Acceptance Inspection performed upon issue prior to being placed in service and a Special Inspection every 90 days for the Navy and every 120 days for the Army thereafter. The Acceptance/Special inspection shall be a visual inspection performed at the organizational level or above in accordance with [paragraph 3-30](#). For US Army users, the inspection cycle will be an acceptance inspection performed at the organizational level or above and a special inspection every 120 days in accordance with AR-95-1.

3-30. Visual Inspection. Visual inspection of the Survival Vest shall be performed as follows:

- 1. Inspect all survival items in accordance with NAVAIR 13-1-6.5.

- 2. Ensure all pockets are securely fastened to vest.
- 3. Inspect fabric for cuts, tears, and abrasions.
- 4. Inspect stitching for security.
- 5. Inspect pocket and snap fasteners for secure attachment and closure.

NOTE

Inspect snap socket to ensure the lug is centered 180° behind the “Dot” imprinted on the cap of the snap. If the socket is loose and rotated the lug out of alignment with the dot on the cap, the aircrewmember will not be able to open the pocket and access their survival equipment. Refer to [paragraph 3-38](#) for corrective procedures.

- 6. Ensure required survival items are present and securely attached.
- 7. Inspect slide fastener for damage, security, and ease of operation.
- 8. Verify overall condition of survival vest.
- 9. Ensure inspection is completed and corrective action has been taken on any discrepancies found.

10. If cleaning is required, clean in accordance with [paragraph 3-31](#).

11. Repack vest in accordance with [paragraph 3-21](#).

12. Document inspection in accordance with OPNAVINST 4790.2 Series/DA Pamphlet 738-751.

3-31. CLEANING. Clean Survival Vest as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Detergent, General Purpose	Commercial or MIL-D-16791

- 1. Mix a proper strength solution of detergent following manufacturer’s instructions.
- 2. Ensure all survival items are removed from vest.
- 3. Immerse vest in solution and allow to soak for five minutes. Agitate gently with hands for two minutes, then remove from solution and allow to drain; do not wring.
- 4. Rinse vest in cool, fresh water until all traces of detergent are gone.



Do not use dryer. Do not hang in direct sunlight.

5. Hang vest on wooden hanger in a well-ventilated area until dry. Do not iron or press.

6. Repack vest in accordance with paragraph 3-21.

3-32. REPAIR/REPLACEMENT/FABRICATION.

3-33. Repairs and replacement shall be performed at the lowest level of authorized maintenance. Table B-4 lists the common repairs and replacements to maintain serviceability. Loose or broken stitching may be re sewn using the appropriate thread. Small holes or tears may be stitched together or patched with the appropriate material. The CMU-33A/P22P-18(V) Survival Vest is manufactured using a flame-resistant (FR) coated raschel knit nylon mesh, and aramid oxford nomex cloth. The horizontal one-inch webbing is a FR coated webbing, MIL-W-43668. The binding tape is an aramid oxford nomex cloth and pockets are made of oxford aramid nomex and ballistic nylon stiffener. The vest and pockets have pull-the-dot and omnidirectional snap fasteners. The vest is also equipped with nylon hook and pile fastener. The slide fastener used for the Type I Vest is a dual heavy-weight with plastic teeth and metal slide and is olive green in color. For the Type II Vest, the slide fastener is medium heavy metal with a black chemical finish. The chain stops and pull-tabs are made of brass.

3-33A. REPAIR OF VEST WEBBING. If webbing pulls out of the binding tape and the webbing displays frayed or torn ends, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Thread, Nylon, Size E	V-T-295 NIIN 00-204-3884
As Required	Fastener, Snap, Unidirectional Stud	MS27983-3 NIIN 00-276-4908
As Required	Fastener, Snap, Unidirectional Eyelet	MS27983-4 NIIN 00-276-4978

NOTE

All stitching shall be Type 301 lockstitch, 8 to 10 stitches per inch. Overstitch 1/2 inch.

1. Remove pockets from affected area.
2. Trim and sear frayed end of webbing.
3. Using care, remove the stitching from the binding tape in the affected area, taking time to remove any stray threads. If necessary, remove the omnidirectional snap stud(s) and the stitching from slide fastener from the affected area of the vest.

4. If free end of webbing is long enough to be re-inserted under the binding tape then proceed to step 6, if not proceed as follows.

5. Place webbing onto mesh so the webbing free end is no further than 3/8 inch in from the mesh edge ensuring a minimal loop dimension of 1 inch.



Take care to avoid stitching through the inside pocket flap.

6. Fasten the webbing to the mesh using four (4) rows of stitching side by side.
7. Replace the binding tape using two (2) rows of stitches.
8. If necessary, sew slide fastener tape back in place.
9. If necessary, replace snap stud.

3-33B. REPAIR OF VEST HARNESS KEEPER. If the bartack or snap from the vest harness keeper tears away from the mesh, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Thread, Nylon, Size E	V-T-295 NIIN 00-204-3884
As Required	Tape, Nylon, 1-Inch, Type IV	MIL-T-5038 NIIN 00-261-8579
As Required	Fastener, Snap, Unidirectional Stud	MS27983-3 NIIN 00-276-4908
As Required	Fastener, Snap, Unidirectional Eyelet	MS27983-4 NIIN 00-276-4978

NOTE

All stitching shall be Type 301 lockstitch, 8 to 10 stitches per inch. Overstitch 1/2 inch.

1. Bartack repair procedures.
 - a. Remove pockets from affected area.

b. Remove stray threads from the webbing and mesh.

c. Cut a 2-inch piece of 1-inch wide Type IV webbing or equivalent, center it (top to bottom) over the damaged area on the inside of the vest on the mesh.

d. Fasten the webbing to the mesh using three (3) rows of stitching side by side on the upper and lower ends.

e. Flip the vest over and fasten the webbing loop onto the patch using four (4) rows of stitching side by side.

2. Snap repair procedures.

a. Remove snap and dress area.

b. Cut a 2-inch piece of 1-inch wide Type IV webbing or equivalent and center it (top to bottom) over the damaged area on the inside of the vest on the mesh.

c. Fasten the webbing to the mesh using three (3) rows of stitching side by side on the upper and lower ends.

d. Punch hole in webbing to accommodate new snap.

e. Attach new snap to vest.

3-33C. REPAIR OF RASCHEL KNIT NYLON MESH. To repair small tears and holes in the raschel knit nylon mesh, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Thread, Nylon, Size E	MIL-T-5038 NIIN 00-261-8579
As Required	Tape, Nylon, 1-Inch, Type IV	MIL-T-5038 NIIN 00-261-8579

NOTE

Tears in the raschel mesh fabric, exceeding four inches in length, may not be repaired. Replace the affected panel with one salvaged from another vest or replace the entire survival vest.

- 1. If necessary, remove pockets from affected area.
- 2. Carefully trim stray threads from affected area.



Take care to avoid stitching through inside pockets, pocket flaps, harness assemblies, and harness keepers.

NOTE

All stitching shall be in accordance with ASTM-D-6193, Type 301 lockstitch, 8 to 10 stitches per inch. Overstitch 1/2 inch.

3. Small punctures, worn spots, or tears less than 1 inch long may be repaired by either darning or stitching several rows of side-by-side stitching with Type E nylon thread, over stitching 1/2 inch in all directions.

4. Tears in the raschel knit nylon mesh may be repaired by sear cutting two pieces of Type IV nylon tape, two inches longer than the tear in the fabric. Center the two pieces of Type IV tape, with one piece on each side, over the tear. Using 1/2 inch of tape, beyond the tear, stitch the two pieces of 1-inch tape in place, using two rows of side-by-side stitching, 1/8 inch from the edge of the 1-inch tape.

5. If pocket attachment webbing must be removed and reattached to perform repairs in step 4 above, refer to procedures outlined in paragraph 3-33A.

3-34. REPAIR/REPLACEMENT OF LPU-21/P AND LPU-23/P COLLAR LOBE ATTACHMENT STRAP. Repair/replace LPU collar lobe attachment strap as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Webbing, Nylon, Type III, CL 2, 1-Inch, OG 106	MIL-W-43668
	or	
	Webbing, Nylon, Type XVII, 1-Inch	MIL-W-4088 NIIN 00-267-3009
2	D-ring, CL 2, 1-Inch, Steel, Black	MIL-R-3390 NIIN 00-260-1415
2	Loop Slide, 1-Inch, Black	MS51940-9S NIIN 00-821-5871
As Required	Thread, Nylon, Size E	V-T-295 NIIN 00-204-3884

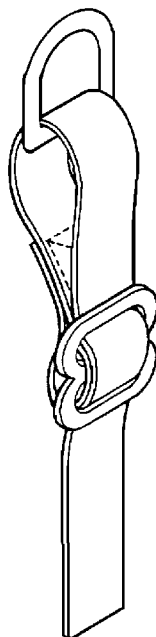
1. Sear cut 13-inch length of one-inch nylon webbing.

2. Reeve end of webbing strap through the loop slide 1 1/2 inch, fold back and sew strap together using 3/4 X 1/4-inch crossbox stitch 1/16 inch from end to secure strap to loop slide.

3. For right collar lobe attachment, reeve the free end of the webbing strap up through bottom of vest horizontal loop at row H, column 2 (figure 3-5). Pass webbing through D-ring and back down through loop slide (figure 3-8).

4. Follow procedure in steps 1, 2, and 3 for left collar lobe attachment strap.

5. Adjust for size by adjusting length of strap through loop slide. To prevent webbing from slipping through each of the loop slides and losing adjustment, pass the end of the webbing back up through the loop slide and secure with a single tacking through the middle bar of the loop slide. The tacking shall be two turns of size E nylon thread, single. The tackings shall pass through all layers of the nylon webbing, around the center bar of the ladder loop, back up through all layers of the nylon webbing and be tied off using a surgeon's knot followed by a square knot and a binder's knot.



674-011

Figure 3-8. LPU Collar Lobe Attachment Strap

3-34A. ATTACHMENT OF THE SEA (ARMY) AND SRU-40/P HELICOPTER AIRCREW BREATHING DEVICE (HABD) MOUTHPIECE COVER. To attach the SEA/HABD mouthpiece cover to D-ring of LPU collar lobe attachment strap, proceed as follows:

Materials Required

Quantity	Description	Reference Number
1	Cable Tie, Black	MS3367-1-0 NIIN 00-984-6582

CAUTION

To prevent damage to mouth piece cover, do not over tighten cable tie.

1. If LPU-21/P life preserver is utilized on AIR-SAVE survival vest, use cable tie attachment tool to attach mouthpiece cover to collar lobe attachment strap D-ring with cable tie.

2. If low profile flotation collar is utilized on AIR-SAVE survival vest, utilize previously removed LPU-21/P collar lobe attachment strap and attach mouthpiece cover to D-ring in same manner as in step 1. Install attachment strap onto survival vest attachment loop above installed HABD pocket. If LPU-21/P collar lobe attachment strap had been previously discarded, fabricate new strap in accordance with paragraph 3-34.

3-35. REPAIR/REPLACEMENT OF THE SURVIVAL VEST WAIST BELT LOOPS. To repair/replace securing belt loops, refer to figure 3-9 and proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Webbing, Nylon, Type XVII, CL 2, 1-Inch Wide	MIL-W-4088 NIIN 00-267-3009
1	Fastener, Snap, Omnidirectional, Button	MS27980-1B NIIN 00-359-6844
1	Fastener, Snap, Omnidirectional, Socket	MS27980-6B NIIN 00-295-6250
1	Fastener, Snap, Omnidirectional, Stud	MS27980-7B NIIN 00-842-1879
1	Fastener, Snap, Omnidirectional, Eyelet	MS27980-8B NIIN 01-023-3843

Materials Required		
Quantity	Description	Reference Number
As Required	Thread, Nylon Size E	V-T-295 NIIN 00-204-3884
1	DOT Snapmaster	89-M840 (CAGE 13940)
1 Set	Punches and Dies for Omnidirectional, Snap Fastener	4303, 4304, 4403, 4404 (CAGE 13940)

1. Carefully cut two rows of stitching securing aramid binding tape to remove damaged webbing belt loop.
2. Sear cut 6-inch length of 1-inch nylon webbing.
3. Attach omnidirectional stud (MS27980-7B) and eyelet (MS27980-8B) 2 inches from bottom end of 6-inch length of nylon webbing using DOT Snapmaster and omnidirectional punch (4304) and die set (4404).

NOTE

- Ensure socket and stud are installed on same side of webbing.
4. Two inches from opposite end of webbing install omnidirectional button (MS27980-1B) and socket (MS27980-6B) using DOT Snapmaster and the omnidirectional punch (4303) and die set (4403).
 5. Lay webbing belt loop button side down (stud and socket facing up) on vest. Inserted stud end of belt loop into open aramid binding tape where thread was cut in step 1. Resew binding tape securing belt loop to vest using two rows of size E nylon thread

8 to 10 stitches per inch and overlapping old stitching on both sides of new belt loop installation.

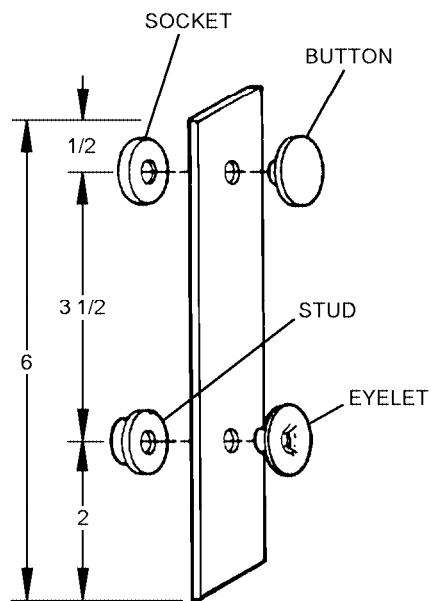
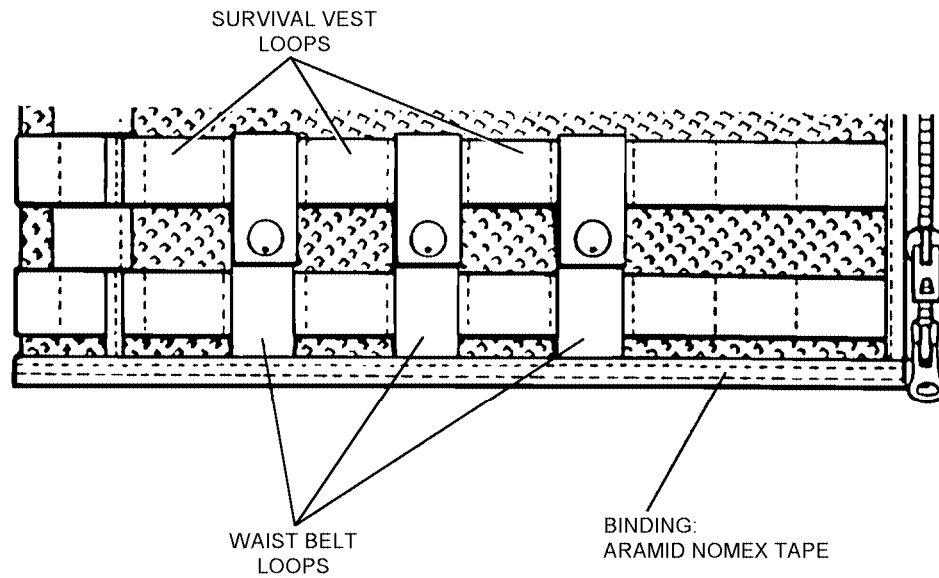
3-36. REPAIR/REPLACEMENT OF TYPE I VEST LOOPLOCS. Replace/repair shoulder rings (looplocs) on Type I vest as follows:

Materials Required		
Quantity	Description	Reference Number
2	Looploc	3241AS302-10 (CAGE 30003)
As Required	Webbing, Nomex, Type II, 1-Inch, OG 106	MIL-W-43685
	or	
	Tape, Nylon, 1-Inch, OG, Type II, CL 2	MIL-T-5038
As Required	Thread, Nylon, Size E	V-T-295 NIIN 00-204-3884

1. Lay vest on flat surface with outside of vest facing up and shoulders at top.
2. Sear cut 3-inch length of 1-inch of nylon webbing or tape.

NOTE

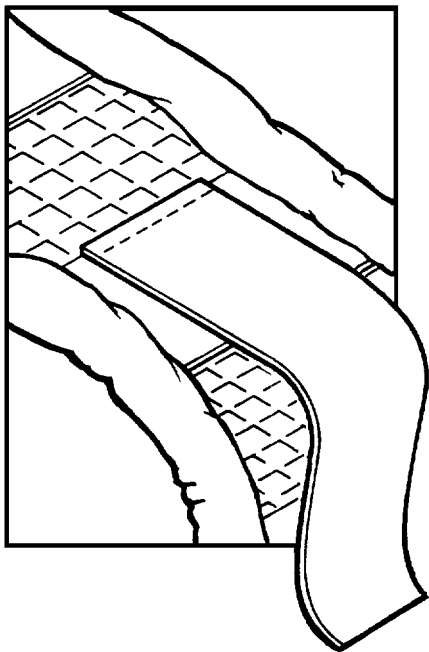
- Remove hoisting harness if necessary.
3. Locate right shoulder seam area where the front and rear mesh sections are sewn together.
 4. Position webbing with end centered on the shoulder seam and with length perpendicular to the seam.



674-012

Figure 3-9. Fabrication of Waist Belt Loops

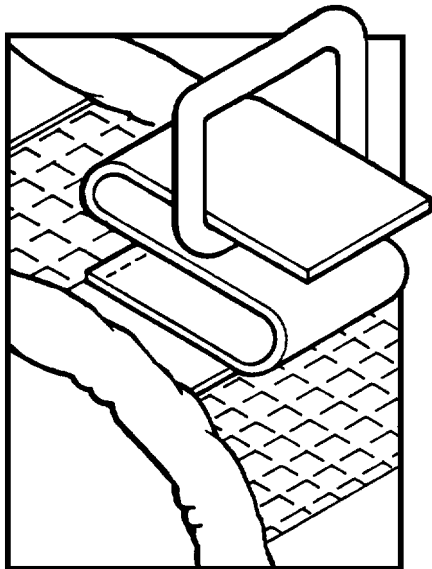
5. Tack down end of webbing using size E nylon thread 8 to 10 stitches per inch 1/8 inch from end.



Step 5 - Para 3-36

674-013

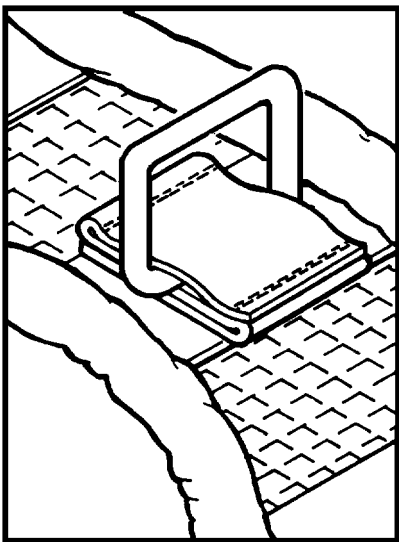
6. S-fold webbing into three equal lengths of approximately 1 inch and position looploc in top fold.



Step 6 - Para 3-36

674-014

7. Double stitch ends of S-fold using size E thread 8 to 10 stitches per inch 1/8 inch from edge of folds securing looploc in position.



Step 7 - Para 3-36

674-015

8. Repeat steps 1 through 7 to install looploc on left shoulder.

3-37. REPAIR/REPLACEMENT OF HOISTING HARNESS. The hoisting harness shall be repaired/replaced at the lowest level of maintenance possible. Refer to figure 3-10 and proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Webbing, Nylon, Type XIII, 1 23/32-Inch, Olive Green 106	MIL-W-4088 NIIN 00-260-4585
As Required	Webbing, Elastic Cotton, Type I, Class 3, 1-Inch, OG	MIL-W-5664 NIIN 00-263-3600
2	Friction Adapter	MS22019
1	Snap Link 'D' Black	A-A-50041, Type III, Class 2 NIIN 01-513-5885
1	Chest Strap Buckle	MS70101-1
As Required	Thread, Nylon, 6 Cord	V-T-295 NIIN 00-204-3749

Materials Required (Cont)

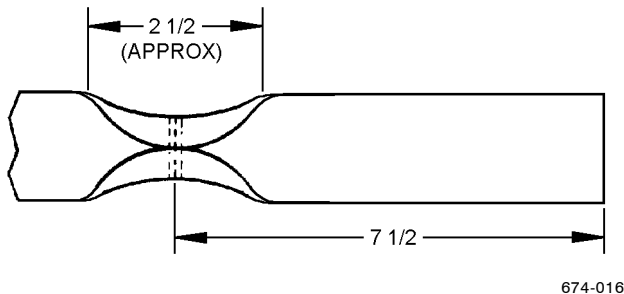
Quantity	Description	Reference Number
As Required	Thread, Nylon, Size E	V-T-295 NIIN 00-204-3884
1	Cutter, Nylon Webbing	C-70513 NIIN 00-956-0081
As Required	Thread, Nylon, 3 Cord	V-T-295 NIIN 00-559-5212

NOTE

All stitching shall be Type 301 Lockstitch, 4 to 6 stitches per inch using size 6 nylon thread unless otherwise indicated. Over-stitch 1/2 inch wherever possible.

1. Cut and sear two 128-inch lengths of Type XIII nylon webbing to fabricate leg straps.

a. On each length of leg strap webbing measure and mark 7 1/2 inches from one end. At mark, fold edges of webbing inward so edges meet in lengthwise center of webbing. Sew together using three rows of stitching.



Step 1a - Para 3-37

b. Form reinforced loop by folding end of webbing back at stitches (7 1/2-inch mark), with folded edges inside, and stitch together using 5-inch, 4-point W, 1/8 inch from seared end.

c. With seared end of 7 1/2-inch fold facing down, measure 22 inches from folded end and mark. Weave opposite end of webbing through friction adapter, MS22019, around crossbar stamped with part number. Center 22-inch mark on inside edge of crossbar and fold webbing so that 7 1/2-inch fold forming the reinforced loop is on the inside, laying against reinforcement webbing (figure 3-10). Sew a 5-inch, 4 point W, 1 1/2 inches from fold at friction adapter.

d. From fold at friction adapter, measure and mark webbing at 8 1/2 inches, 10 1/2 inches and 12 1/2 inches. Sew two rows of stitches across webbing at each mark.

e. With reinforced loop facing down, fold free end opposite friction adapter under one inch and sew a 3/4 x 1 1/2-inch crossbox stitch, 1/8 inch from edges.

2. Cut and sear 70-inch length of Type XIII nylon webbing and fabricate chest strap as follows.

a. Measure and mark 13 inches from one end.

b. Weave measured end of webbing through the friction adapter, MS70101-1, and back to 13-inch mark. Sew a 5-inch, 4-point W, 1 1/2 inches from fold.

c. Fold back corner of free end to form a triangle. Sew a single row of stitches 1/8 inch from edges of triangle.



Step 2c - Para 3-37

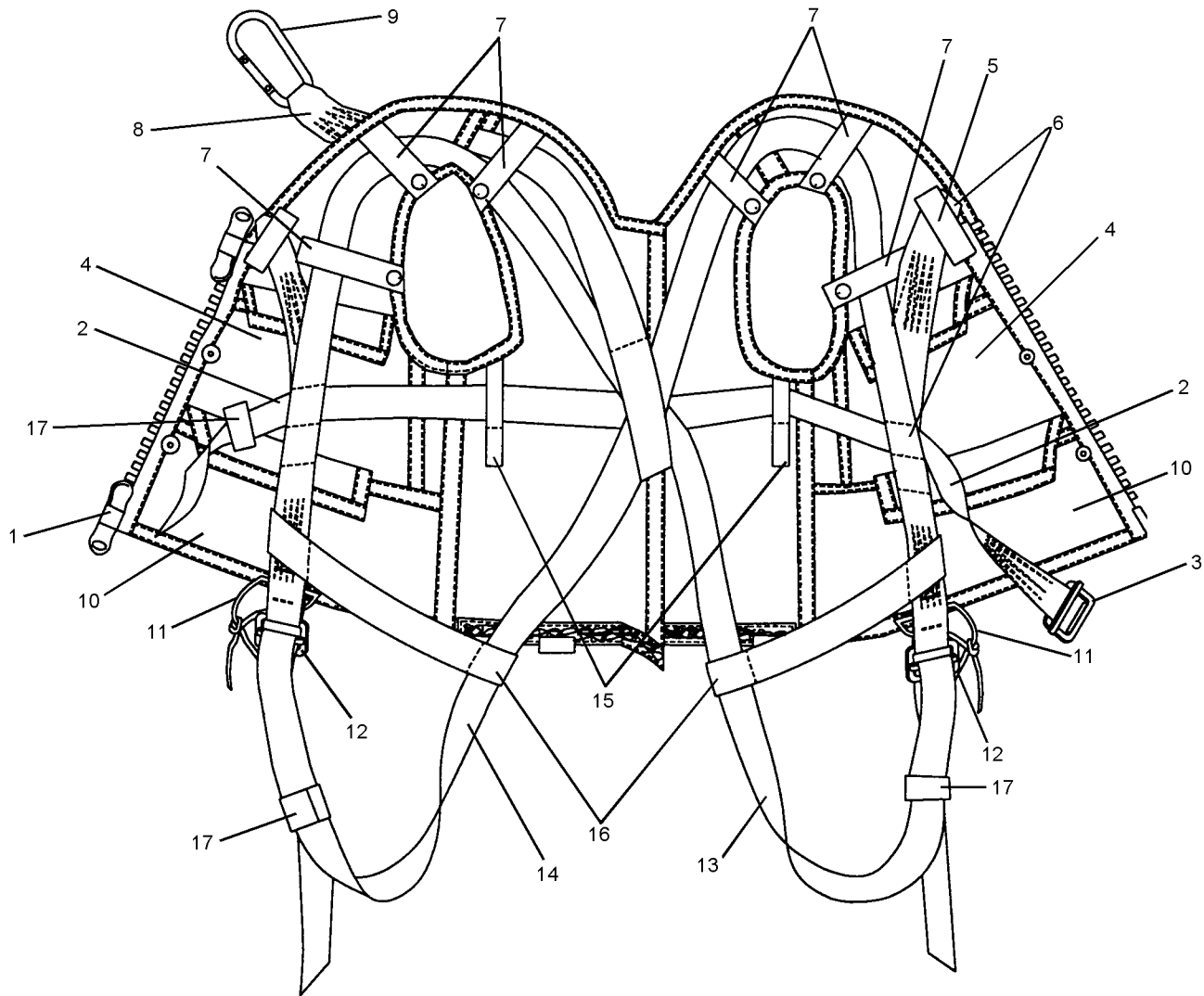
3. Cut and sear two 12 1/2-inch lengths of Type XIII nylon webbing and fabricate leg strap retainers as follows:

a. On each 12 1/2-inch length of webbing, measure six inches from both seared ends and mark. Fold ends in and align with marks. Sew a 1/8 x 1 1/2-inch boxstitch 1/8 inch from both seared ends, forming two channels.

4. Cut and sear a 35-inch length of Type XIII nylon webbing and fabricate lift strap as follows:

a. Measure 6 1/2 inches from one end of the 35-inch length of webbing and mark. Fold webbing inward at mark so edges meet in center of webbing. Sew three rows of stitches. See step 4a above.

b. Form reinforced loop by folding webbing at stitching, ensuring width wise folds are inside of fold. 1/8 inch from seared end, sew a 5-inch, 4-point W.

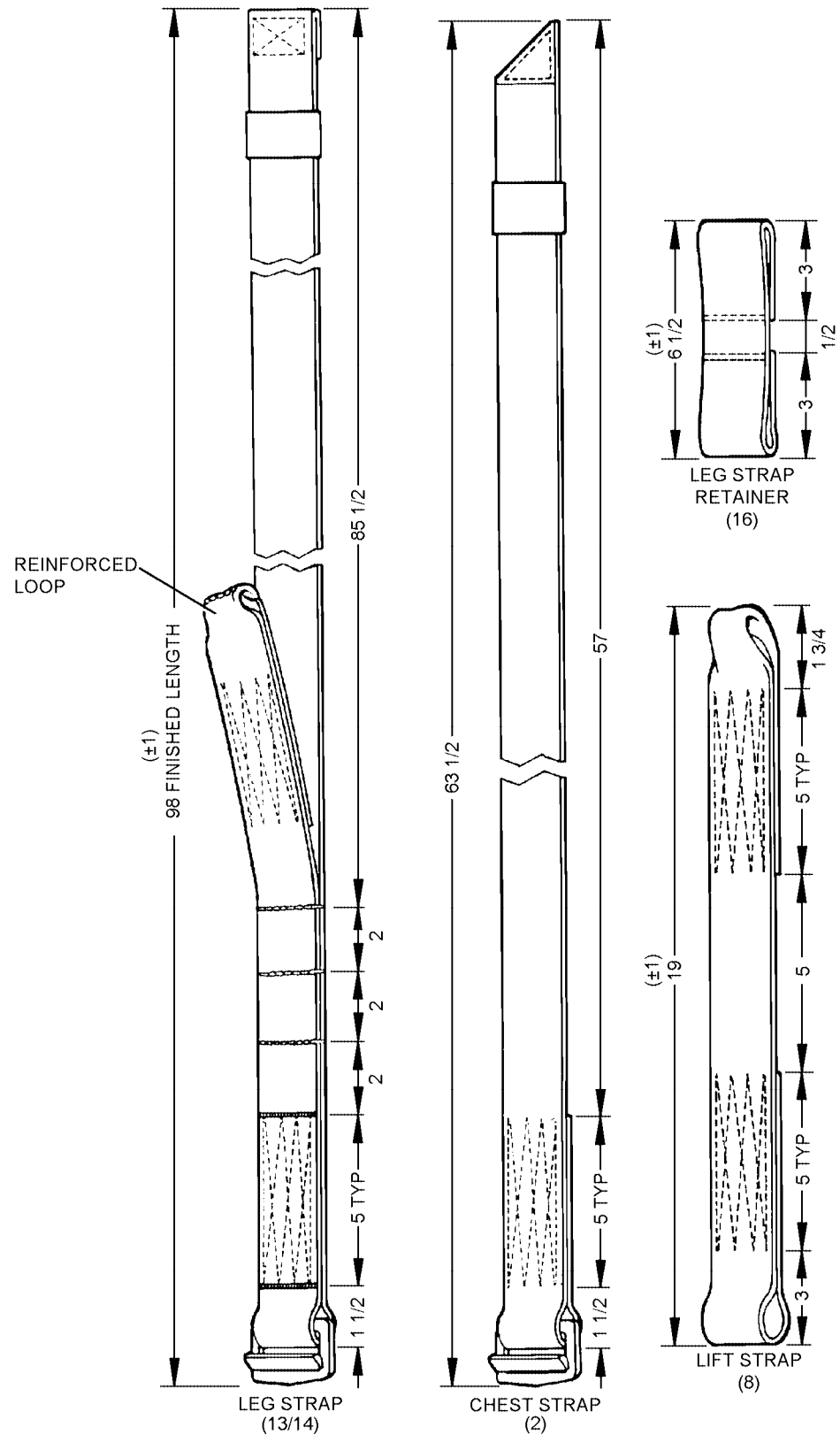


(INTERIOR)

- | | |
|----------------------------------|---|
| 1. SLIDE FASTENER | 10. INSIDE POCKETS (GENERAL KIT, MEDICAL KIT) |
| 2. CHEST HARNESS | 11. HARNESS RETAINER CORD |
| 3. FRICTION ADAPTER (CHEST) | 12. FRICTION ADAPTERS (LEGS) |
| 4. INSIDE POCKETS (WATER BAGS) | 13. LEFT LEG STRAP |
| 5. FRONT LIFT ATTACHMENT CHANNEL | 14. RIGHT LEG STRAP |
| 6. FRONT LIFT ATTACHMENT LOOP | 15. CHEST STRAP CHANNELS |
| 7. HARNESS RETAINER STRAPS | 16. LEG STRAP RETAINERS |
| 8. LIFT STRAP | 17. HARNESS KEEPERS |
| 9. HOIST RING | |

00301001

Figure 3-10. Survival Vest, Type I, With Hoisting Harness Installed (Sheet 1 of 2)



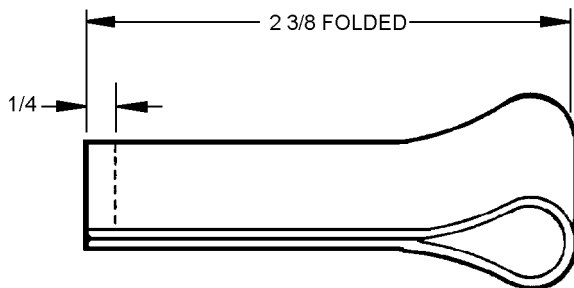
674-055

Figure 3-10. Survival Vest, Type I, With Hoisting Harness Installed (Sheet 2 of 2)

c. Measure 19 inches from opposite end and mark. Fold seared end and align with mark. Sew a 5-inch, 4-point W, 1/8 inch from seared end of webbing.

5. Cut 4 3/4-inch length of 1 inch elastic webbing and fabricate webbing keeper as follows.

a. Fold 4 3/4-inch length of webbing in half. Sew two rows of stitches 1/4 inch from ends using size E thread 8-10 stitches per inch. Turn inside out.



674-018

Step 5a - Para 3-37

b. Fold 1/4 tips back and sew down with a single row of stitches using size E thread 8-10 stitches per inch.

6. To assemble the hoisting harness refer to figure 3-10 and proceed as follows.

a. Lay the leg straps side by side vertically on a work bench, with the friction adapters at the bottom and the reinforced loops facing down.

b. Place the lifting strap vertically between the leg straps with the folds facing down and the reinforced loop at the bottom.

c. Weave left (as viewed on bench) leg strap through right channel of one of the leg strap retainers and slide down to friction adapter. Weave right leg strap through left channel of other leg strap retainer and slide down to friction adapter.

d. Weave ends opposite friction adapters through the channel opposite the reinforced loop of

the lift strap. Pass the left strap through from left to right and the right strap from right to left, forming an X in the middle of the channel. Approximately five feet of webbing must be passed through the channel.

e. Grasp lift strap channel and X format by left and right leg strap and rotate 180 degrees toward worker so that reinforced loop passes under X and ends up at the top.

f. Fold the leg strap retainer located by the left friction adapter in half so that the empty channel is on top. Weave the end of the left leg strap through the open channel and pull through approximately 3 1/2 feet of webbing. Repeat procedure for other leg strap.

g. Ensure leg strap retainers remain in the same position as previous step. Slide elastic webbing keepers onto ends and up to the leg strap retainers. Weave ends of leg straps through friction adapters by passing the webbing down through the friction adapter between the slide bar and attaching webbing and then back up through friction adapter between slide bar and fixed cross bar.

NOTE

Even though the vest is received from supply with the harness attached, follow steps 7 thru 10 to ensure the harness is installed correctly.

7. To ensure proper attachment of the harness to the vest, proceed as follows:

a. Open vest and lay on a work bench with the inside facing up.

b. Lay the harness on top of the vest with the lift strap at the top and the front lift attachment points facing down. If the chest strap and D-ring are attached, remove them.

c. Route six harness retaining straps around harness shoulder straps and snap.

d. With the vest laid out and open, as if the wearer were laying on their back, in the same position as figure 3-1, weave the chest strap through the top channel of the left harness, first top chest strap channel in left rear vest panel, lift strap loop, second top chest strap channel in right rear vest panel, through top chest strap channel of right harness and pull strap through.

e. Thread one end of harness retainer cord through loop attaching leg strap friction adapter. Thread other end through loop from opposite direction. Tie ends together with a surgeon's knot followed by a square knot.

f. Route front lift attachment loops through front lift attachment channels located at the top of the slide fastener.

g. Route free end of lift strap along inside of vest and harness channel at right shoulder. Attach D-ring so that gate faces slide fastener and gate pivot is closest to reinforced loop. Grasp webbing in hand, and pull D-ring taut. Pinch webbing as close as possible to D-ring to ensure a tight fit. Tack D-ring in place on both sides of webbing using 2 turns of waxed 6-cord, single thread, tied off with a surgeon's knot, square knot, and binder's knot. Tackings should be 1/4 inch from edge of webbing and as close as possible to D-ring. Place D-ring under retaining flap and close.

8. Repair of Hoisting Harness Retaining Straps.

a. The vest has six hoisting harness keepers and two alignment holder straps (figure 3-10), all made with MIL-W-43668, TY III, 1-inch olive green nylon webbing. If stitching is torn, re sew as necessary. If webbing is torn, cut stitching and remove torn tape, being careful not to damage the vest. Prepare replacement webbing and stitch in place using size E thread, 8 to 10 stitches per inch.

NOTE

When replacing harness holder alignment straps, ensure sewn alignment channels of tapes are properly oriented. The high side of the channel on each alignment strap must be aligned toward the opposite shoulder, or center of vest.

3-37A. INSTALLATION OF LEG STRAP QUICK RELEASE FITTINGS.

NOTE

Installation of leg strap quick release fittings are optional for assigned rotary wing aircrewmember only and shall be performed at the organizational maintenance level.

Materials Required

Quantity	Description	Reference Number
2	Ejector Snap	68D37721-3
As Required	Ink, Black, Waterproof	TT-I-542
As Required	Compound, Sealing	F-900 Torque Seal (Color Optional)
2	V-Ring	59C381

NOTE

The ejector snap and V-ring may be ordered through the Naval Supply System or direct from Capewell Life Support, 860-610-0700.

1. Forcibly hold the harness webbing against one corner of the adapter to avoid inadvertently cutting or getting metal particles on the webbing.

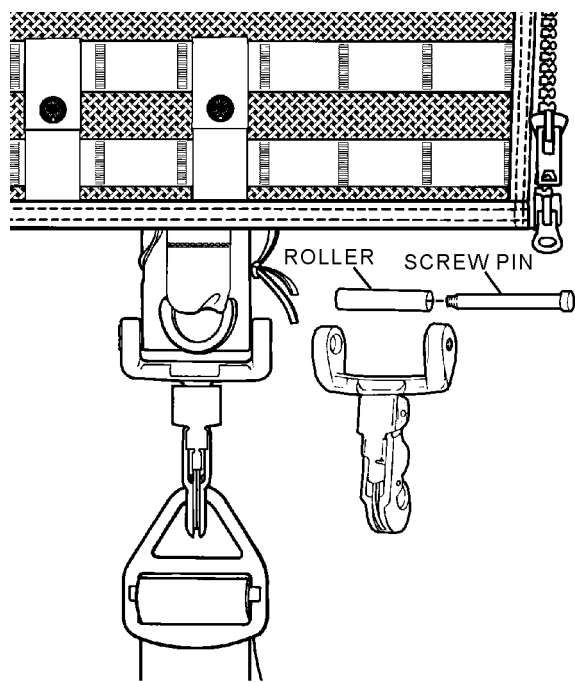


Use extreme care to ensure harness webbing is not damaged during the cutting and removal process.

2. Using a standard hacksaw, cut friction adapter MS22019 at the cleared corner of the adapter.

3. Once the friction adapter has been cut open, pry the two halves apart leaving enough room for the webbing to be removed from the adapter.

- 4. Discard the friction adapter.
- 5. Insert the sleeve assembly into the harness webbing loop that the friction adapter had been installed in.
- 6. Install the ejector snap over the sleeve assembly, with the quick ejector facing away from the aircrewmember's leg. Insert the removable pin through the ejector snap and sleeve assembly.



Steps 5 and 6 - Para 3-37A

- 7. Torque the removable pin to 20 to 25 in-lb and apply torque seal to the removable pin screw head.

NOTE

Upon completion of installation, the ejector snap hook should be facing against the aircrewmember's leg.

- 8. On the free end of harness leg strap, weave the one-inch fold over, around and through the friction bar of the V-ring.
- 9. Using black, waterproof ink, write the new part number (3561AS302-1A) on the identification label.
- 10. Ensure leg strap webbing adjusts and locks properly when harness webbing is routed through friction bar of V-ring.
- 11. Document in accordance with OPNAVINST 4790.2 Series.

3-38. REPAIR/REPLACEMENT OF MODULAR POCKETS. Minor rips and tears may be repaired and attachment straps replaced. However, if repair of damaged modular (stowage) pockets cannot be readily accomplished by simple sewing procedures, new pockets shall be ordered. See Table 3-5.

Materials Required

Quantity	Description	Reference Number
As Required	Snap Fastener, Cap	MS27983-1 NIIN 00-891-9073
As Required	Snap Fastener, Socket	MS27982-2N NIIN 00-276-4970
As Required	Snap Fastener, Stud	MS27983-3 NIIN 00-276-4908
As Required	Snap Fastener, Post	MS27983-4 NIIN 00-276-4978

- 1. If pocket closure directional snaps are damaged, will not tighten down or cannot be made to open, replace them with standard Pull-The-Dot directional snap fasteners.
- 2. Dura dot snaps on HABD pocket attachment strap may be replaced with Pull-the-Dot directional snaps to prevent the HABD pocket from inadvertently becoming unsnapped from the vest.

3-38A. REPAIR OF KNIFE POCKET. To repair the knife pocket, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Webbing, Nylon, Type XII	MIL-W-4088 NIIN 00-281-3012
As Required	Thread, Nylon, Size E	V-T-295 NIIN 00-204-3884

NOTE

All stitching shall be in accordance with ASTM-D-6193, Type 301 lockstitch, 7 to 10 stitches per inch. Sear cut nylon webbing. Backstitch and overstitch minimum 1-inch where needed.

- 1. Remove knife pocket from vest.
- 2. Remove knife from sheath.
- 3. Locate the front top of the knife sheath opening and mark binding tape on both sides of the sheath and also on back side of pocket.

Table 3-5. Repair/Replacement of Pockets

Stowage Pocket	NIIN
General Pocket	01-442-1988
Radio Pocket	01-441-1693
Helicopter Emergency Egress Device (HEED) Pocket (Type I) (Note 1)	01-441-3294
Helicopter Aircrew Breathing Device (HABD Type III) and SEAL Pocket (Note 1)	01-441-3293
Flashlight Keeper	Fabricate
CBR/Oxygen Attachment	Fabricate
LPU-21/P and LPU-23/P Collar Lobe Attachment Straps	Fabricate
Type II Vest Torso Harness Attachment Straps	Fabricate
Survival Knife Pocket	01-441-3298
Pistol Pocket/Ammo Keeper (Note 1)	01-441-3299
Oxygen Pocket	TBD
E-2C Oxygen Pocket	TBD
V-22 Oxygen Regulator Pocket	Fabricate
Notes: 1. Not part of the vest; must be ordered separately.	

4. Mark bottom of pocket on binding tape for reference point of fold.

5. Slide leather sheath from fabric pocket and fold to one side.

NOTE

Some leather sheaths may be sewn to pocket, therefore it may require removal of some stitching from the sheath.

6. Carefully remove stitches from sides of pocket to bottom and clear stitch area of used thread.

7. With pocket opened and the front snap flap inside exposed, at the sheath opening reference point, measure and mark 1 inch on each side toward the snap hardware at top of pocket flap.

8. With flap laying completely flat, measure the width between the 1-inch reference marks.

9. For the length of webbing required, triple the width measurement and subtract 3/4 inch. Sear cut the required length of webbing.

NOTE

Webbing will wrap around pocket flap and completely overlap on inside facing knife sheath when in place.

10. Position top edge of webbing at 1-inch reference marks. Ensure pocket flap fabric is flat, and

sandwich flap with webbing. Overlap the webbing with each seared end located at the opposite inside edge of binding tape on inside of flap.

11. When the webbing is flat and sides aligned, box stitch in place, 1/8 inch from webbing edge. Mark center on each folded edge side of webbing for reference alignment when re-sewing.

12. At bottom of opened pocket, locate snap reinforcement webbing sewn in place, flatten, and along lower edge measure width of pocket. Refer to Step 7 for complete measurement and attachment of webbing. When sewing, ensure top edge of webbing butts against the snap reinforcement webbing.

NOTE

Re-sew sheath to fabric pocket if stitching was removed.

13. Locate alignment reference marks and refold pocket sides in place.

14. Re-sew together following original stitch line with one (1) row of stitching. The stitch stop points shall be finished with four (4) rows of stitching side by side, 3/4-inch minimum length.

15. Reinsert leather sheath/scabbard and knife completely into pocket, close and snap flap closed. Ensure knife hilt and metal edge of sheath/scabbard are properly covered.

3-38B. REPAIR OF SURVIVAL VEST AND MODULAR POCKETS ATTACHMENT CORD.

Materials Required

Quantity	Description	Reference Number
As Required	Thread, Nylon, Size E	V-T-295 NIIN 00-204-3884

NOTE

- All backstitching shall be ASTM-D-6193, Type 301 lockstitch, 8 to 10 stitches per inch. Backstitch or overstitch minimum 1 inch.
1. Remove all survival items from affected pockets. Untie 48-inch length of nylon cord from failed attachment loop and set survival items aside.
 2. Ensuring end of attachment loop cord is seared, lay attachment loop over top of binding tape where loop pulled loose.
 3. Using 3 rows of stitching, re-stitch loop on top of binding tape by oversewing 1 inch over top of attachment loop. Ensure loop is centered inside 1-inch stitch line and all 3 rows of stitching pass through the attachment loops.
 4. Re-stow survival items into pockets and inspect completed action in accordance with paragraph 3-22.
 5. Document in accordance with OPNAVINST 4790.2 Series.

3-38C. FABRICATION OF THE SURVIVOR’S RETAINING LINE. The survivor’s retaining line enables survivors who do not use the LPU-21/23 Series life preservers to hook together in the water. The survivor’s retaining line is mandatory for all aircrewmembers that wear the LPU-34, 36, and 37/P Low Profile Flotation Collar (LPFC) and is accomplished at the Organizational maintenance level or above. To fabricate the survivor’s retaining line, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Thread, Nylon, Size E	V-T-295 NIIN 00-204-3884
48 inches	Webbing, Nylon, Type II, 1-inch, Yellow	MIL-T-5038 NIIN 00-190-0521
1	Snap Hook, Spring	M43770/1-SWZE4 NIIN 01-187-9402

NOTE

All stitching shall be in accordance with ASTM-D-6193, Type 301 Lockstitch, 8 to 10 stitches per inch. Backstitch a minimum of 1 inch.

1. Cut 12 inches of webbing from the 48-inch length. Sear ends of both pieces.
2. Position snaphook 12 1/4 inches from one end of longer piece of webbing and stitch as shown using size E nylon thread (figure 3-10A).
3. Form a loop at the opposite end of line by folding over 2 inches from the end of the line. Sew the fold with a 3/4-inch by 3/4-inch box stitch, 1/8 inch from the end of the line. This will leave a 1 1/8-inch loop when completed.
4. Fold the 12-inch piece of webbing in half lengthwise and sew to the opposite end of the retaining line.
5. Sew the 12-inch piece of webbing to the retaining line. Fold the reinforced end of the retaining line in half and sew the 4-inch fold with a 3/4-inch by 3 3/4-inch box stitch.
6. Attach the survivor’s retaining line to the survival items pocket designated by the aircrewmember.

7. One of the pocket attachment straps will be unsnapped and unwoven from the vest attachment loops, then fed through the 1-inch loop formed in step 3. The pocket attachment strap will then be re-woven through the vest’s attachment webbing and re-snapped in place, as before. The survivor’s retaining line will now be secured to the webbing, before the webbing is placed through the first attachment loop on the vest.

8. Stow the survivor’s retaining line by accordion folding the yellow webbing with the snaphook in the middle of the folds and securing with a rubber band. Insert the retaining line length wise into the edge of the survival items pocket with the yellow handle protruding under the outside edge of the pocket flap for ease of access.

3-39. FABRICATION OF FLASHLIGHT KEEPER. To fabricate keeper for attachment of flashlight, refer to figure 3-11 and proceed as follows:

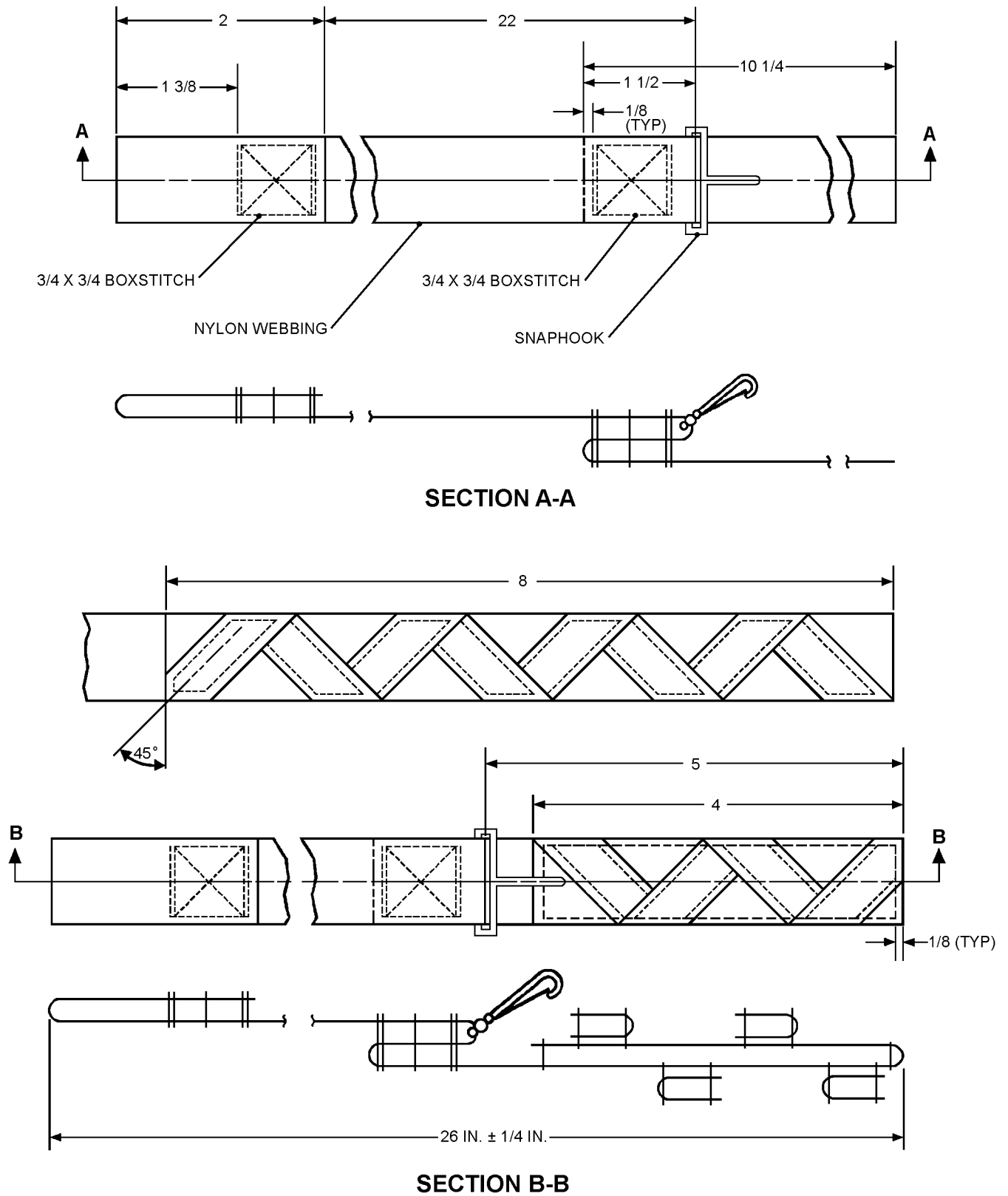


Figure 3-10A. Survivor's Retaining Line, Details

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NAVAIR 13-1-6.7-4

Materials Required

Quantity	Description	Reference Number
As Required	Webbing, Elastic, OG, CL 1, 1-Inch	MIL-W-5664 NIIN 00-263-3600
As Required	Webbing, Nylon, Type III, 1-Inch, CL 2	MIL-W-43668
	or	
	Webbing, Nylon, Type XVII	MIL-W-4088 NIIN 00-267-3009
2	Thread, Nylon, Size E	V-T-295 NIIN 00-204-3884
4	Fastener, Snap, Unidirectional Stud	MS27983-3 NIIN 00-276-4908
4	Fastener, Snap, Unidirectional Eyelet	MS27983-4 NIIN 00-276-4978
4	Fastener, Snap, Unidirectional Button	MS27983-1 NIIN 00-891-4907
4	Fastener, Snap, Unidirectional Socket	MS27983-2 NIIN 00-893-6243
1	DOT Snapmaster	89-M840 (CAGE 13940)
1 Set	Punches and Dies for Unidirectional Fastener, Snap	(4304, 4404) also (CAGE 13940) (4305, 4405)

1. Cut two 8-inch lengths of elastic webbing.

a. To prepare 6-inch retension bands, fold each end of 8-inch elastic webbing over 1 inch and sew 3/4 x 3/4-inch crossbox stitch using size E nylon thread staying 1/16 inch from edge.

2. Cut 7 1/2-inch length of nylon webbing. Measure and mark 1 1/8 inch from each end.

a. Center 6-inch folded elastic webbing, with folded ends down, on nylon webbing inside of measured mark and perpendicular to the nylon webbing.

b. Fold each end of nylon webbing over the elastic webbing with end flush with edge of elastic webbing and sew together with 3/4 x 3/4-inch crossbox stitch using size E nylon thread.

c. Install snap fastener stud in right end of each assembled elastic webbing with button on folded underside of webbing and the stud on top.

d. Install snap fastener socket in left end of each assembled elastic webbing with socket on folded underside of webbing and the button on top.

e. Attach flashlight keeper by inserting top and bottom elastic webbing keeper straps under vest webbing loops. Top keeper strap will be above webbing loop and bottom keeper will be below vest webbing loop.

f. The flashlight will be held in the assembled keeper encircled by the elastic webbing keeper straps snapped closed.

3-40. VERTICAL ATTACHMENT OF THE HABD/SEA POCKET. The HABD/SEA pocket may be modified to allow attachment of the pocket in the vertical position at the discretion of the aircrew. To modify the pocket for vertical attachment, proceed as follows:

NOTE

All stitching shall be ASTM-D-6193, Type 301 lockstitch, 8 to 10 stitches per inch. Backstitch or overstretch a minimum of 1 inch.

Materials Required

Quantity	Description	Reference Number
As Required	Thread, Nylon, Size E	V-T-295 NIIN 00-204-3884
As Required	Webbing, Nylon, Type IV, 1-Inch	MIL-T-5038 NIIN 00-655-5123
As Required	Tape, Nylon, Type III	MIL-T-5038 NIIN 00-753-6144
2	Fastener, Snap, Omnidirectional Button	MS27980-1B NIIN 00-359-6844
2	Fastener, Snap, Omnidirectional Socket	MS27980-6B NIIN 00-295-6250
2	Fastener, Snap, Omnidirectional Stud	MS27980-7B NIIN 00-842-1879
2	Fastener, Snap, Omnidirectional Eyelet	MS27980-8B NIIN 00-023-3843

1. Remove the HABD/SEA bottle and hose assembly from the pocket to be modified and set aside for later re-installation.

2. Remove the hose stowage pocket from the bottle pocket and set aside for later re-attachment.

3. Using a hot iron, sear off all three diagonal attaching straps and discard. Be careful not to burn through the ballistic cloth backing.

4. Remove the three dura dot studs and posts from the bottle stowage pocket, taking care not to damage the material of the pocket, and discard.

5. Carefully remove the stitching securing the edge binding tape to the side of the pocket the studs and posts were removed from, in step four. Cut or sear cut the loose edge binding tape from the top edge of the pocket to the bottom edge and discard.

6. Using a sharp knife or equivalent, cut the three attaching loops free from the pocket's ballistic backing piece by removing the center bar tacking and the stitching on each end of the attaching loops. Discard the removed attachment loops and clean all ends of the cut thread off the backing piece.

7. Using a marking pencil or equivalent, place a centering mark on both the top and bottom edge of the ballistic backing piece. With a straight edge, connect the two marks so the centerline of the backing piece is marked from the top to the bottom. This centerline will be used as a reference line for the new attaching loops. Make an additional mark 1 3/4 inch down from the top, on each side. Using a straight edge, connect these two marks. This will be the reference point for attaching the two new attachment straps.

8. To make the new attachment straps, sear-cut two 9 1/2-inch pieces of 1-inch wide webbing. Set a dura dot cap and socket, centered 1/2 inch from one end of each piece of webbing and set aside for later attachment.

9. To make the new attachment loops, sear-cut three 4-inch pieces of 1-inch wide webbing. Using a marking pencil or equivalent, place a centering line across the width of each piece of webbing, 2 inches from each end.

10. With the pocket's ballistic backing facing up towards the installer. Place one of the attachment straps, with the socket facing up and above the top of the backing piece. Place the other end of the webbing on the reference mark from [step 7](#) and centered between the centering mark and the inside edge of the edge binding tape. Stitch in place with a 3/4-inch box "X" stitch, 1/8 inch from all edges of the webbing. Repeat this procedure with the other strap.

11. Place the first of the 4-inch long attaching loops, 1/2 inch below the attaching strap's box "X" stitches, with the centering line of the webbing lying over the backing piece's centering line from [step 7](#).

Sew the attaching loop in place with three rows of stitching through the centering lines. Ensure the pocket has been turned out sufficiently to avoid sewing through the nomex material. Place the second attaching loop 1 inch below the bottom edge of the first and secure it in the same manner. Place the third attaching loop 1 inch below the bottom of the second and secure it in the same manner.

12. Turn the pocket out to the normal configuration and secure the nomex and ballistic cloth together with a single row of stitches to hold the two pieces of material in place for taping. Sear-cut enough Type III edge binding tape to replace the tape removed in [step 5](#) and stitch in place over the edges of the nomex material and backing piece, using two rows of stitches, 1/4 inch apart, 1/8 inch from the edges of the tape.



It may be necessary to hand walk machine to avoid needle breakage.

13. Placing the edges of the attaching loops over the binding tape on the sides of the backing piece, fold a 3/8-inch turn under and secure in place with four rows of side-by-side stitching overlaying the stitching on the edge binding tape. Repeat this procedure with the opposite end of the attaching loop. Stitch the other two attaching loops in the same manner.

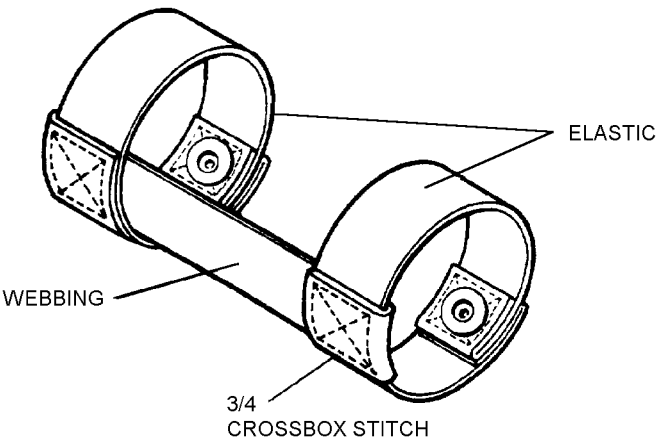
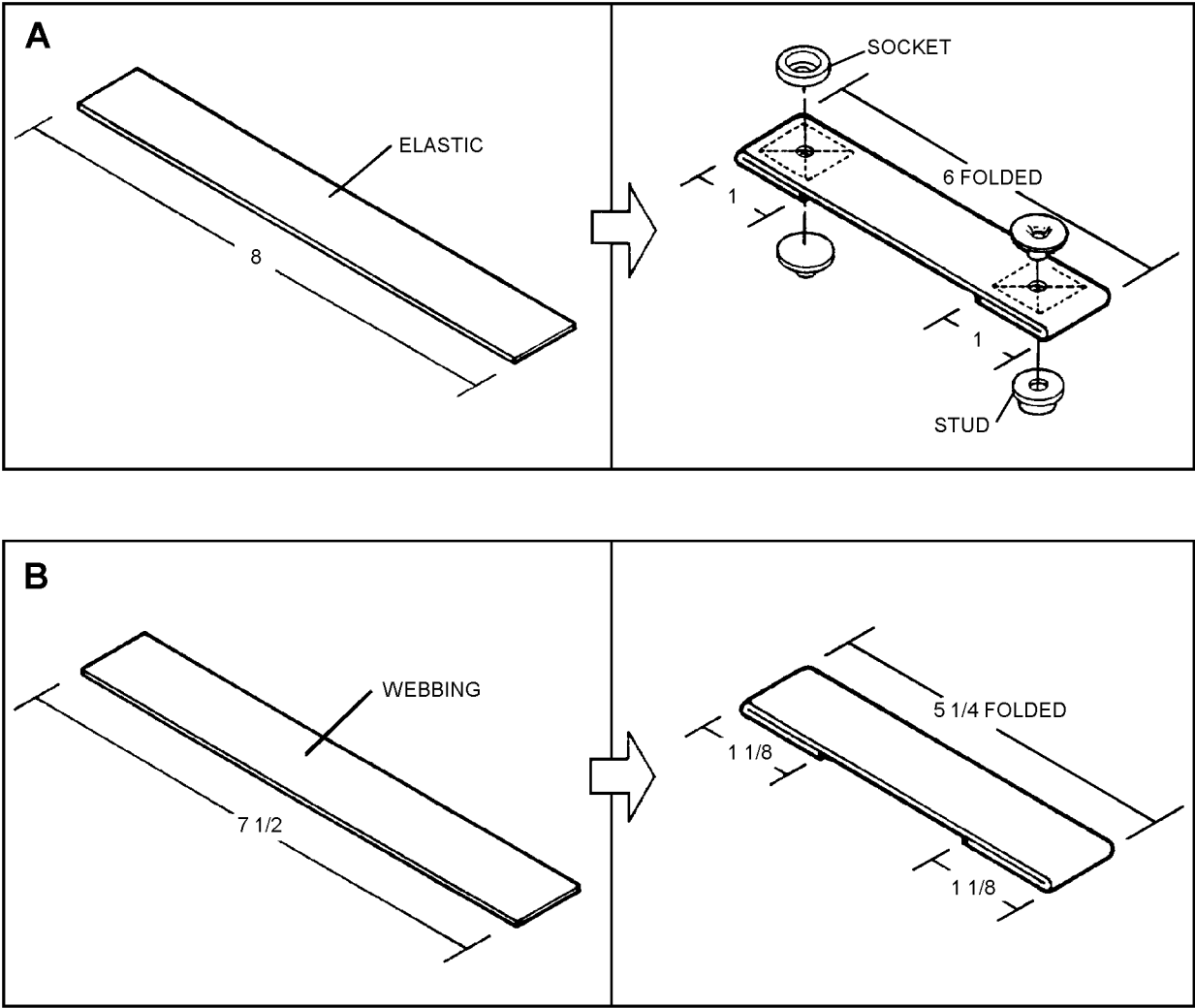
14. Using a marking pencil or equivalent, place a mark on each side of the backing piece, at the junction of 1-inch in from the outside edge and 1-inch up from the bottom edge. Install a dura dot stud and eyelet, ensuring the stud is on the same side as the attachment strap and loops.

15. Re-install the SRU-40/P/SEA in the same manner as it was originally installed and secure the Velcro retaining strap around the bottleneck, below the first stage regulator.

16. The pocket can now be installed on the left front panel of the survival vest, in the location that best suits the aircrewmember's needs.

17. Ensure the mouthpiece cover has been attached in accordance with [paragraph 3-34A](#) in reference to the position of the exit point of the mouthpiece from the hose pocket.

18. If the LPU-21 series life preserver is utilized and the mouthpiece cover is out of position to be properly attached to the life preserver collar lobe attachment strap "D" ring, fabricate an additional strap in accordance with [paragraph 3-34](#) and attach it to the survival vest in the proper location for attachment of the mouthpiece cover in accordance with [paragraph 3-34A](#).



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Figure 3-11. Flashlight Keeper

Figure 3-12. Deleted

3-41. WEARING THE LEATHER SHOULDER HOLSTER WITH THE TYPE I AND TYPE II AIR-
SAVE SURVIVAL VESTS.

NOTE

Refer to NAVAIR 13-1-6.7-1 for aircraft applications of the leather shoulder holster

- 1. The leather shoulder holster is donned under the aircrewmembers left arm, allowing for a right handed release. The chest strap is fit across the back and around the chest and snapped to the D-ring sewn to the top edge of the holster.
- 2. Adjustments are made around the left shoulder by tightening or loosening the straps and re-engaging the adjustment buckle hook prong. The circumference adjustment is made with the chest strap adjustment buckle in the same manner as the shoulder strap. The harness assembly should be made as snug as possible without causing discomfort for the aircrewmember in both a standing and sitting position. Do not remove extra harness strap after fitting aircrewmember.
- 3. Tie the two leather thongs so the knot is on the top of the strap to avoid creating hot spots for the aircrewmember.
- 4. Upon completion of the fitting procedure, inspect entire harness and holster assembly to ensure all adjustments and extra harness strap are tied off and secured. If additional holes are required to affect a proper fit, use a rotatable star punch or equivalent, ensuring the size of the holes cut do not exceed the size of the holes the manufacture initially made for the harness strap adjustment holes. Maintenance and repairs for the leather shoulder holster can be found in NAVAIR 13-1-6.5, Chapter 9.
- 5. Unless wearing soft armor, the leather shoulder holster must be worn over all flight clothing, but under the survival vest (figure 3-12A). If wearing soft armor, the leather shoulder holster is worn over the armor, but under the survival vest (figure 3-12B). If

wearing a torso harness, the leather shoulder holster is worn over the torso harness but under the survival vest (figure 3-12C).

3-41A. FABRICATION OF THE V-22 CRU-103/P OXYGEN REGULATOR POCKET.

Materials Required

Quantity	Description	Reference Number
1 Set of 3 Patterns	See Figure 3-14A	
As Required	Cloth, Nylon Duck	NIIN 00-765-2863
As Required	Webbing, Nylon Type IX	NIIN 00-261-8846
As Required	Webbing, Nylon Type VIII	NIIN 00-261-8585
As Required	Tape, Nylon, Type III	NIIN 00-753-6144
As Required	Thread, Nylon, Size E	V-T-295 NIIN 00-204-3884
As Required	Fastener Tape, Pile, 2 Inch	NIIN 00-405-2265
As Required	Fastener Tape, Hook, 2 Inch	NIIN 00-450-9837
6	Fastener, Snap, Cap	NIIN 00-891-9073
6	Fastener, Snap, Socket	NIIN 00-945-2577
2	Fastener, Snap, Stud	NIIN 00-276-4908
2	Fastener, Snap, Eyelet	NIIN 00-276-4978

NOTE

All stitching shall be with Size E Nylon Thread, 8 to 10 stitches per inch, conforming to ASTM-D-6193, Type 301 lockstitch.

- 1. Prepare patterns in accordance with figure 3-14A.



Figure 3-12A. Type I With Leather Shoulder Holster

003012a



Figure 3-12B. Type I With Soft Armor and Leather Shoulder Holster

003012b



Figure 3-12C. Type II With Torso Harness and Leather Shoulder Holster

003012c

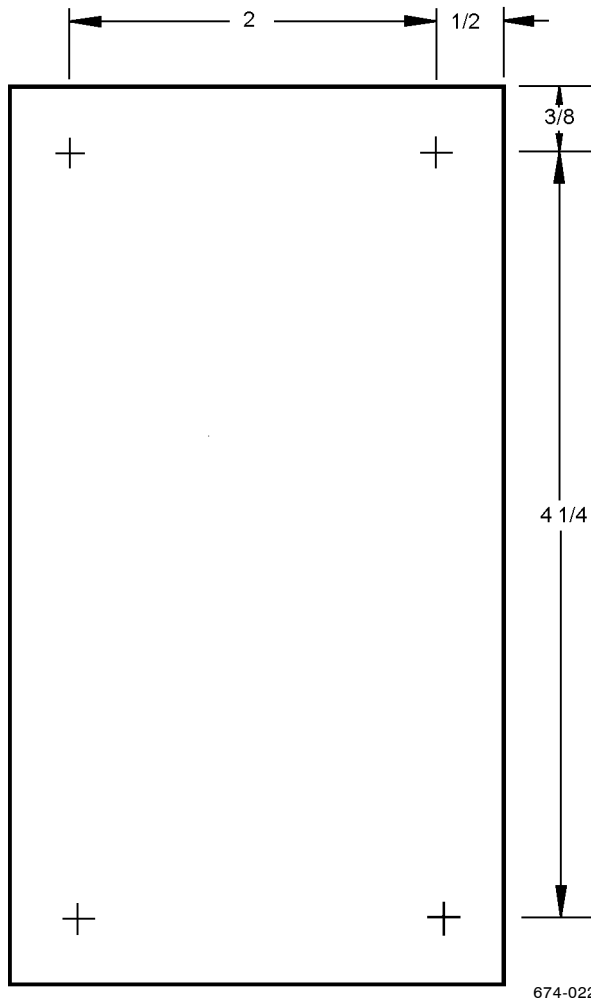


Figure 3-13. Snap Fastener Location Template

Figure 3-14. Deleted

2. Using patterns, mark and cut 1 each using sage green nylon duck cloth.

3. Place "A" on top of "B" and sew around 1 3/8-inch circle on "A".

4. Cut out inside of hole, ensuring to stay 1/8 inch from stitch line, and push remainder of "B" through "A".

5. Pull "B" tight and sew top stitch around hole 1/8 inch from folded edge.

6. Sew 3-inch piece of 2-inch pile tape on top inside flap, in accordance with pattern "A".

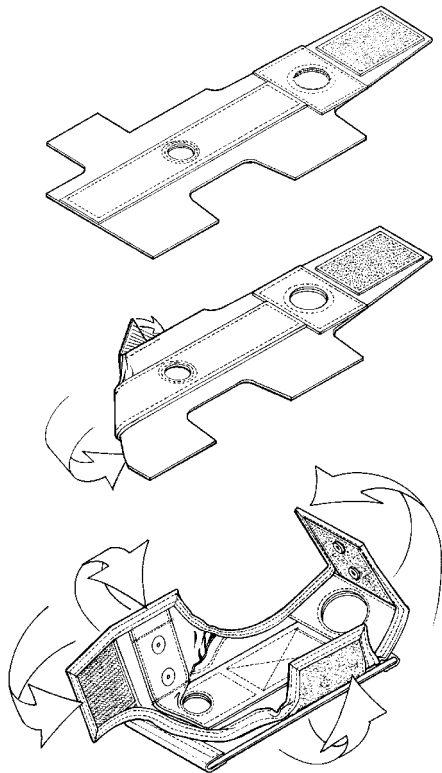
7. Sew 3-inch piece of 2-inch hook tape, 3/4 inch below top of bottom outside flap, in accordance with pattern "A".

8. Center a 9 1/2-inch piece of Type VIII nylon webbing in pocket, 1/2 inch down from 1 1/8-inch hole and sew to bottom of pocket.

9. Cut out and sear 1-inch hole and sew double row of stitching around outside diameter of hole.

10. Invert pocket, and in accordance with folding and sewing marks on pattern "A", fold lower left outside edge of pocket flap over upper left edge of pocket. Sew pocket flap to edge of pocket using 2 rows of side by side stitching, 3/8 inch from edge. Stitching will be from top to bottom of flap and then across bottom of flap to form left side of pocket.

11. Turn pocket right side out and sew 1-inch Type III textile tape around outer edge of pocket. To prevent fraying, use 2 rows of stitching, 1/8 inch and 3/8 inch from edge.



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Steps 10 and 11 - Para 3-41A

12. Sew 3-inch piece of 2-inch pile tape to outside of upper right flap, in accordance with pattern “A”.

13. Sew 3-inch piece of 2-inch hook tape to inside of lower right flap, in accordance with pattern “A”.

14. Install 2 pull-the-dot caps and sockets in accordance with markings on pattern “A”. Ensure that caps are installed on the outside of top flap and the sockets are installed over the 2-inch pile tape on the inside of the flap, with locking lugs on sockets facing towards the 1 1/8-inch hole on top flap.

15. Install 2 pull-the-dot studs and eyelets on the inside of the lower pocket, in accordance with markings on pattern “A”. Ensure the eyelets are installed on the inside of the pocket and the studs are installed on the outside of the pocket over the 2-inch hook tape.

16. Mark, cut, and sear one piece of Type IX webbing in accordance with pattern “C”.

17. Overlap and sew 2 pieces of 2-inch hook tape to cover one entire side of Type IX webbing.

18. To prevent fraying, sew Type III, 1-inch textile tape on top and bottom ends of Type IX webbing.

19. Sew Type IX webbing to outside of “A” using cross box stitch as per marks on pattern “A”. Ensure that hook tape is facing away from pocket.

20. Mark, cut, and sear second piece of Type IX webbing in accordance with pattern “C”.

21. Overlap and sew 2 pieces of 2-inch pile tape, to cover one entire side of Type IX webbing.

22. Install 4 pull-the-dot caps and sockets to the second piece of Type IX webbing, in accordance with pattern “C”. The sockets shall be installed on the webbing side and the caps shall be installed on the side with the pile velcro tape.

23. Install regulator pocket on AIRSAVE Survival Vest using adapter strap supplied with vest.

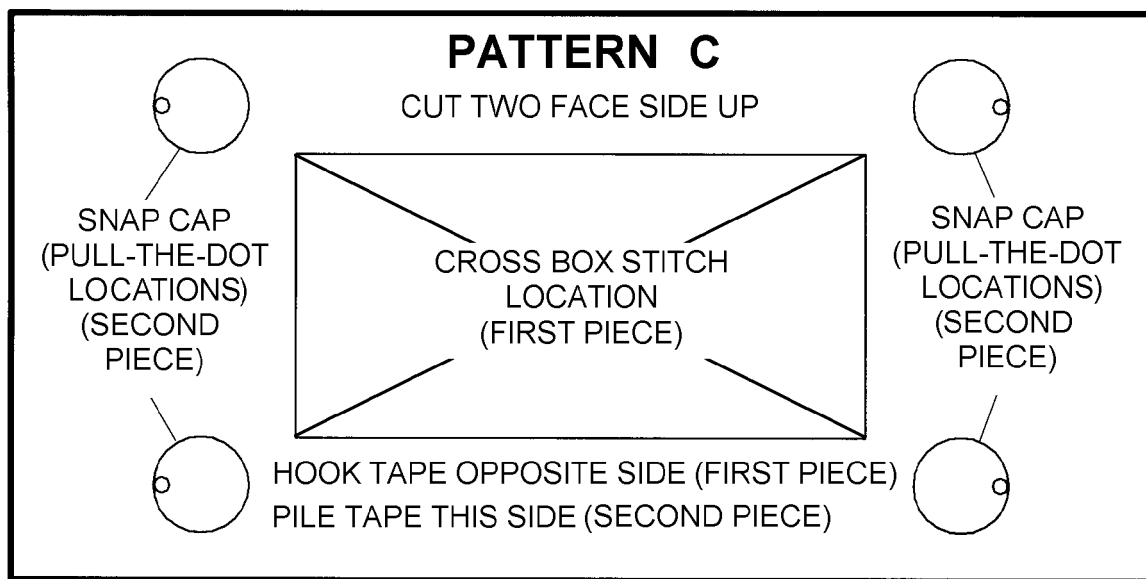
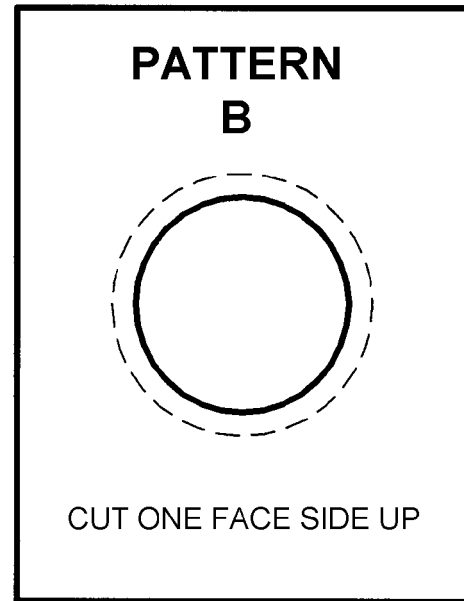
3-42. FABRICATE/REPAIR CBR ATTACHMENT.
To fabricate/repair CBR Attachment, refer to figure 3-15 and proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Webbing, Nylon, Type III, 1-Inch	MIL-W-43668 NIIN 00-753-6194
	or	
	Webbing, Nylon, Type XVII, 1-Inch	MIL-W-4088 NIIN 00-267-3009
6	Fastener, Snap, Unidirectional Stud	MS27983-3 NIIN 00-276-4908
6	Fastener, Snap, Unidirectional Eyelet	MS27983-4 NIIN 00-276-4978
As Required	Thread, Nylon, Size E	V-T-295 NIIN 00-204-3884
1	DOT Snapmaster	89-M840 (CAGE 13940)
1 Set	Punches and Dies for Unidirectional Fastener, Snap	4304, 4404 (CAGE 13940)

NOTE: Procedures for the construction of the pattern.

1. Print out all segments of pattern.
2. Trim segments 2 and 3 at the dashed trim line, ensuring the alignment marks (crosses) remain on the pattern segments.
3. Align crosses with adjacent pattern segments and tape in place.
4. After taping, cut out all patterns.



This figure has been divided into multiple segments to facilitate the printing of the pattern.

Figure 3-14A. (V-22) CRU-103 Oxygen Regulator Pocket (Sheet 1 of 3)

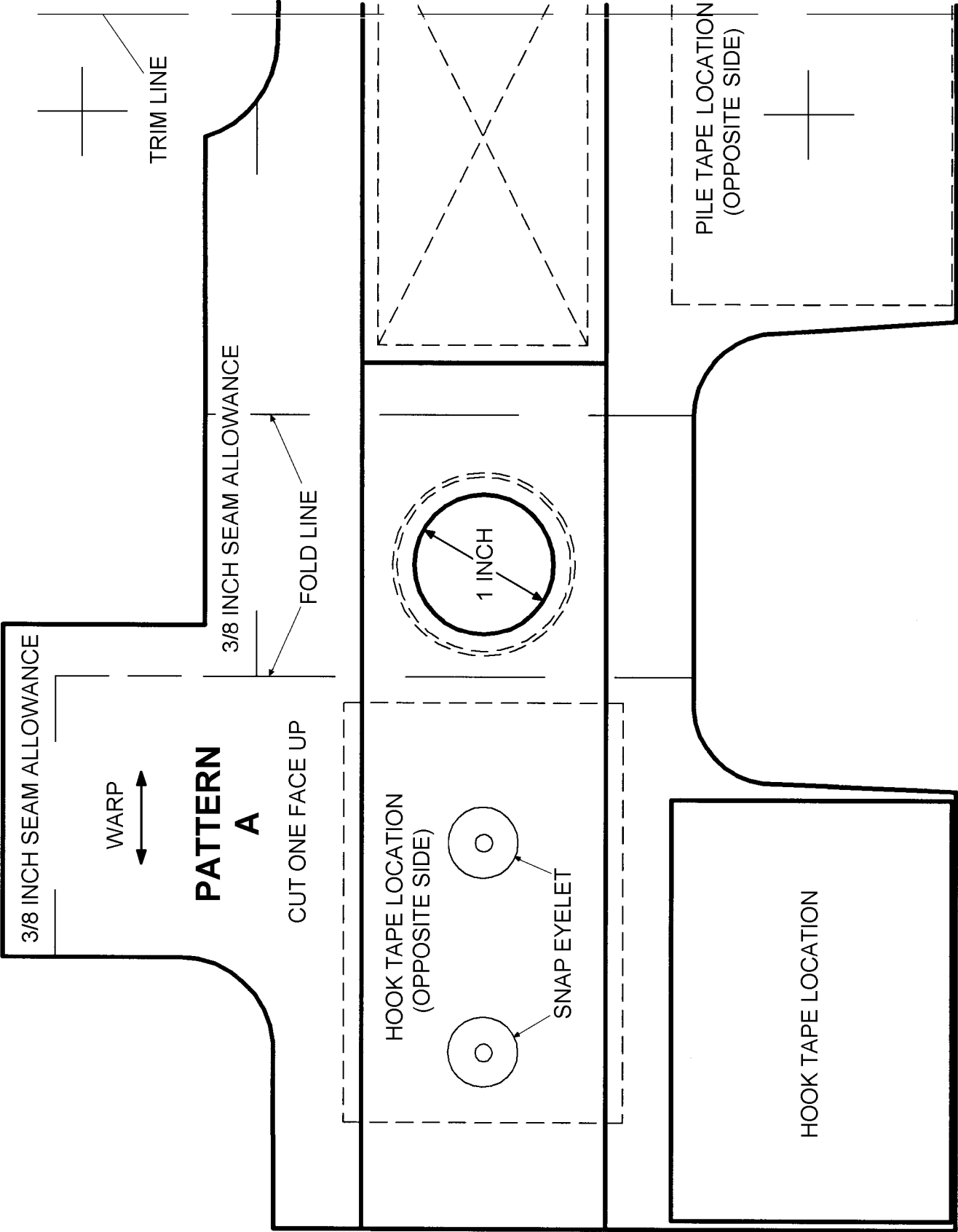


Figure 3-14A. (V-22) CRU-103 Oxygen Regulator Pocket (Sheet 2 of 3)

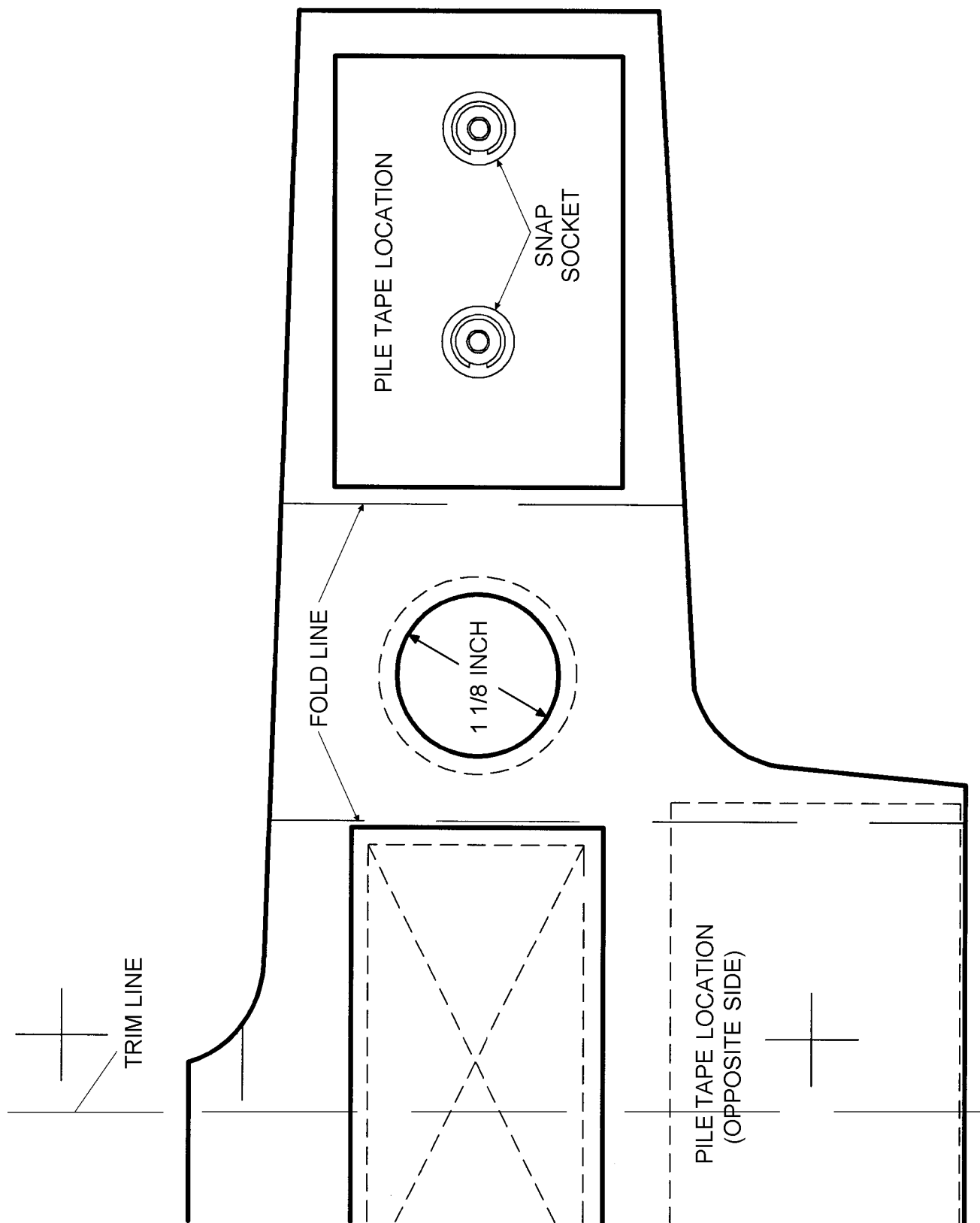


Figure 3-14A. (V-22) CRU-103 Oxygen Regulator Pocket (Sheet 3 of 3)

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Materials Required

Quantity	Description	Reference Number
As Required	Hook Fastener, 1-Inch, Olive Green	MIL-F-21840 NIIN 00-405-2266
As Required	Pile Fastener, 1-Inch	MIL-F-21840 NIIN 00-106-5974
1	Loop Slide, 1-Inch, Black	MS51940-9S NIIN 00-664-6395
As Required	Webbing, Nylon, Type IV, 1-Inch, Olive Green	MIL-T-5038 NIIN 00-261-8579
As Required	Thread, Nylon, Size E	V-T-295 NIIN 00-204-3884

1. Sear cut 9-inch length of 1-inch nylon webbing.
2. At one end of webbing, sew a 2 x 1-inch piece of MIL-F-21840 hook fastener using size E thread 8 to 10 stitches per inch, keeping 1/16 inch from the end and edges.
3. On the same side of the webbing, one inch from hook fastener, sew a 2-inch length of MIL-F-21840 pile fastener to the webbing, keeping 1/16 inch from the edge of the webbing.
4. The webbing opposite the fastener end can then be placed through the 1-inch loop slide and through one of the lower, horizontal webbing loops on the vest. Loop the webbing back through the loop slide. Place the oxygen hose along the webbing strap and bring the hook fastener around the oxygen hose and attach it to the pile fastener to hold the oxygen hose securely in place.

3-43A. RELOCATION OF THE OXYGEN MASK RETENTION SNAP ON THE TYPE II VEST. To relocate the oxygen mask retention snap, proceed as follows:

Materials Required

Quantity	Description	Reference Number
1	Fastener, snap, omnidirectional, stud	NIIN 00-276-4908
1	Fastener, snap, omnidirectional, post	NIIN 00-276-4978

NOTE

Relocation of the oxygen mask retention snap is at the aircrewmember's discretion.

1. Remove the existing oxygen mask retention snap installed on Row I, Column 5 on the left side of the vest (figure 3-5).
2. Install the new snap fastener in Row I, Column 2 on the left side of the vest.

3-44. REPAIR/REPLACEMENT OF SLIDE FASTENER. To remove and replace damaged slide fastener, proceed as follows:

Materials Required

Quantity	Description	Reference Number
1	(Type I Vest, U.S. Army Only) Slide Fastener, TY IV, Style #15, Auto-lock, Left Hand Separating, Multi-slider LG 14-Inch	V-F-106
1	or (Type I/Type II Vest, USN/USMC Only) Slide Fastener, TY IV, Style #8, Black, Brass LG 14-Inch	V-F-106 NIIN 00-093-5239
1	Nipper, End Cutting	NIIN 00-221-99
6	Fastener, Snap, Omnidirectional Stud	MS27980-7B NIIN 00-842-1879
6	Fastener, Snap, Omnidirectional Eyelet	MS27980-8B NIIN 00-023-3843
As Required	Thread, Nylon, Size E	V-T-295 NIIN 00-204-3884
1	DOT Snapmaster	89-M840 (CAGE 13940)
1 Set	Punches and Dies for Omnidirectional Snap Fastener	(4303, 4403) (CAGE 13940)
2	Top Stop	NIIN 00-276-4939
As Required	Thread, Nylon, Size E	V-T-295 NIIN 00-204-3884

NOTE

When replacing slide fastener in U.S. Army Type I Vests, the 14-inch multislider will be utilized. When replacing slide fasteners in both the Type I and Type II USN/USMC Vests, the LG, black, brass slide fastener will be modified to 14 inch length and utilized.

1. Using end cutting-nippers, remove snap fastener studs and eyelets from vest.
2. Carefully cut two rows of stitching of binding aramid (nomex) tape to remove damaged slide fastener.
3. Insert new slide fastener aligning it so the bottom is even with the bottom of the vest.
4. Double stitch slide fastener to aramid (nomex) binding tape using size E thread, 8 to 10 stitches per inch. Backstitch 1/2 inch.
5. Install new stud and eyelet snap fasteners using DOT Snapmaster and punches and dies (4303, 4403).
6. Repeat above steps to install opposite half of slide fastener on other side of vest.

3-45. Deleted

Figure 3-16. Deleted

3-46. FABRICATE TORSO ATTACHMENT (USED ONLY WITH LPU-23/P). To fabricate the torso attachment for use with the LPU-23/P, refer to [figure 3-17](#) and proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Webbing, Nylon, TY IV	MIL-W-43668 NIIN 00-261-8579
or		
	Webbing, Nylon, TY XVII	MIL-W-4088

Materials Required

Quantity	Description	Reference Number
1	Loop Slide	MS51940-9S NIIN 00-664-6395
1	Fastener, Button, Unidirectional	MS27983-1 NIIN 00-891-9073
1	Fastener, Socket, Unidirectional	MS27983-2 NIIN 00-893-6243
1	Fastener, Stud, Unidirectional	MS27983-3 NIIN 00-276-4908
1	Fastener, Eyelet, Unidirectional	MS27983-4 NIIN 00-276-4978
1	Snap Hook	MIL-S-43770/1A NIIN 01-187-9402
As Required	Thread, Nylon, Size E	V-T-295 NIIN 00-204-3884

1. Cut and sear a 14-inch length of nylon webbing.
2. Weave 1 1/4 inches of one end of webbing around the middle bar of the loop slide, fold end down to meet webbing and sew together with two rows of stitches 1/4 inch from end.
3. Weave opposite end through snaphook and back through loop slide.
4. Fold free end 3/8 inch and sew two rows of stitches 1/8 inch from end.
5. Using rotary punch, make a hole 3/4 inch from folded end and another at 4 inches.
6. Install snap fastener button and socket at 3/4-inch hole and mating stud and eyelet at 4-inch hole.

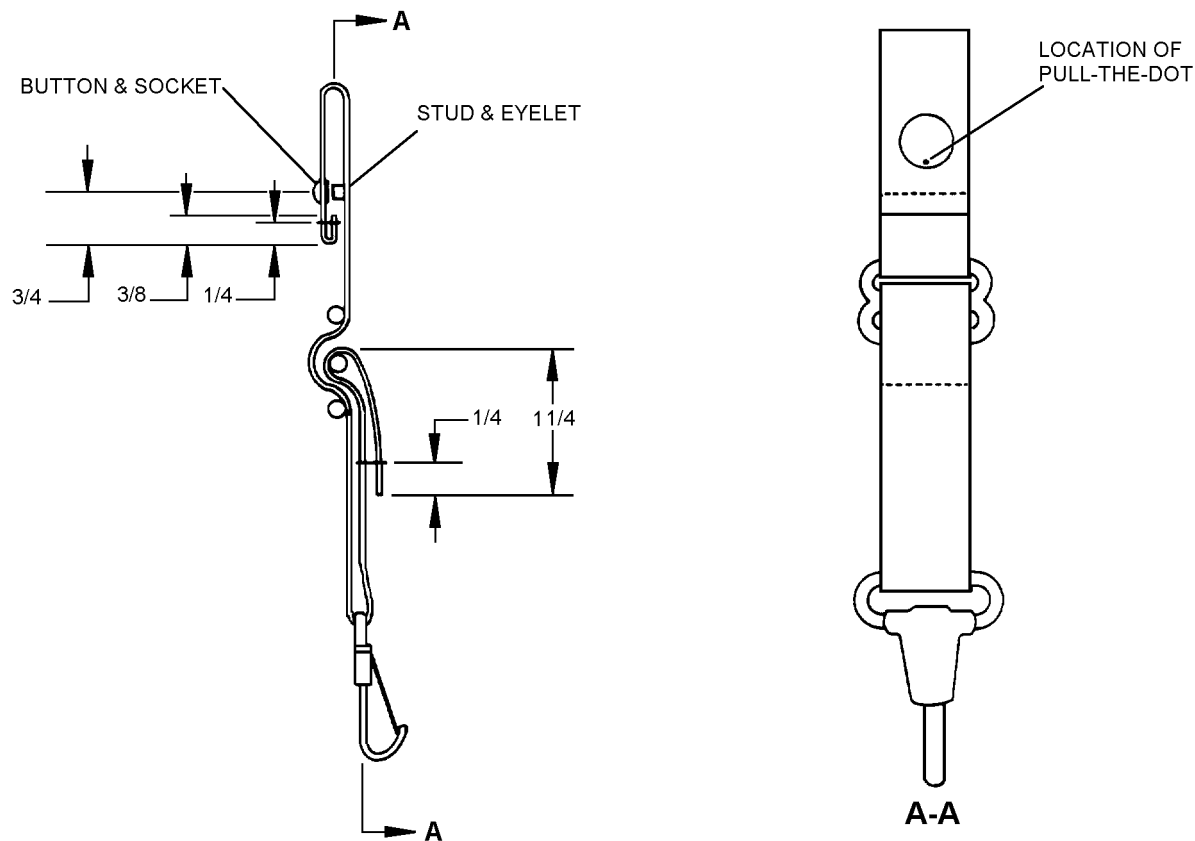


Figure 3-17. Torso Attachment Strap (LPU-23/P Only)

674-026

3-46A. FABRICATION PROCEDURES FOR THE LPU-36/P FLOTATION COLLAR ATTACHMENT STRAPS. To fabricate the LPU-36/P Flotation Collar Attachment Straps, (figure 3-17A) proceed as follows:

Materials Required (Cont)

Materials Required		
Quantity	Description	Reference Number
As Required	Webbing, Nylon, Type IV, 1-Inch	NIIN 00-655-5123
8	D-Ring	MIL-R-3390 NIIN 00-260-1415
As Required	Thread, Nylon, Size E	V-T-295 NIIN 00-204-3884
2	Fastener, Snap, Cap	NIIN 00-891-9073
2	Fastener, Snap, Socket	NIIN 00-945-2577
2	Fastener, Snap, Stud	NIIN 00-276-4908

Quantity	Description	Reference Number
2	Fastener, Snap, Post	NIIN 00-276-4978
2	Snap Hook, 1-Inch Base	NIIN 01-187-9402
2	Slide Buckle	MS51940-9S, NIIN 00-664-6395

NOTE

All stitching shall be Type 301 lockstitch, 8 to 10 stitches per inch using size E nylon thread. Overstitch 1 inch wherever possible.

1. From 1-inch webbing, sear cut front attachment strap webbing piece 18 1/2 inches long. Fold each end over 1 inch and sew with 3/4-inch x 3/4-inch crossbox stitch.

2. Insert one end of the webbing through two D-rings and fold webbing over 4 3/4 inches. Secure D-rings in place by sewing the top and bottom of the folded webbing with a 3/4-inch x 1-inch crossbox stitch, 2 1/2 inches from the end of the strap.

3. Measure 1 inch back from same edge of strap, mark and install snap fastener cap and socket with locking lug installed towards the two D-rings installed in previous strap. Install stud and post on strap directly aligned to mate with cap and socket.

4. Lay strap out with snap fastener cap up and mark opposite end of webbing from D-rings at 7 5/8 inches and 9 inches on the bottom edge of the strap. Mark at 8 5/8 inches and 10 inches on the top edge of the strap. This will later be used to attach the rear attachment strap to the front attachment strap.

5. With strap still layed out, snap fastener cap up, install webbing through slide buckle then install snap

hook with spring clip facing up and secure end of webbing back through slide buckle to allow for length adjustment of the attachment strap. Repeat this process to fabricate the strap for the other side of the vest.

6. Sear cut rear attachment strap webbing piece 8 1/4 inches long. Sear cut one end of the webbing at a 45 degree diagonal angle. Measure 3 3/4 inches in from end opposite diagonal cut, mark and insert webbing through two D-rings, fold webbing over to the mark. Secure D-rings in place by sewing together the top and bottom of the folded webbing with a 3/4-inch x 1-inch crossbox stitch. Duplicate this process with the diagonal being cut in the opposite direction to form the rear attachment strap webbing for the other side of the vest.

7. Place the front attachment strap on the sewing machine with the snap cap facing up. Align the diagonal cut edge on the bottom edge of the front attachment strap between the 7 5/8-inch and 9-inch marks.

NAVAIR 13-1-6.7-4

The rear strap should cross over the top of the front strap at a 45 degree angle between the 8 5/8-inch and 10-inch mark. Sew the straps together with a 3/4-inch x 1-inch crossbox stitch through the rear strap at a 45 degree angle.

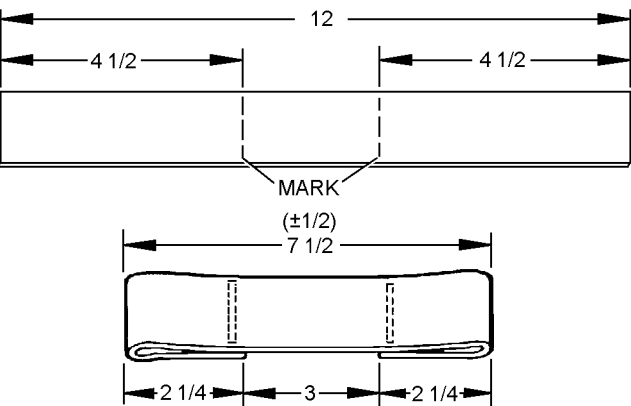
3-47. FABRICATION OF WAIST LOBE ATTACHMENT STRAPS (LPU-21D/P AND LPU-35/P ONLY). Fabricate waist lobe attachment strap as follows:

Materials Required		
Quantity	Description	Reference Number
As Required	Webbing, Nylon, Type XIII, 1 23/32-Inch wide	MIL-W-4088 NIIN 00-260-4585
As Required	Thread, Nylon, Size E	V-T-295, NIIN 00-204-3884

NOTE

All stitching is to be performed with a Type 301 stitch, 8 to 10 stitches per inch, overstitch 3/4 inch.

- 1. Cut and sear two 12-inch lengths of Type XIII nylon webbing.
- 2. Using one 12-inch length of Type XIII webbing, measure 4 1/2 inches from both seared ends of piece and mark. Fold ends in and align with marks.



Step 2 - Para 3-47

- 3. Sew a 1/8 x 1 1/2-inch box stitch 1/8 inch from both seared ends, forming two channels.
- 4. Repeat steps 2 and 3 for second attachment strap.

3-48. ATTACHMENT OF LPU-21/P, LPU-23/P, AND LPU-27/P LIFE PRESERVERS. To attach the LPU-21/P, LPU-23/P, or LPU-27/P life preserver, proceed as follows:

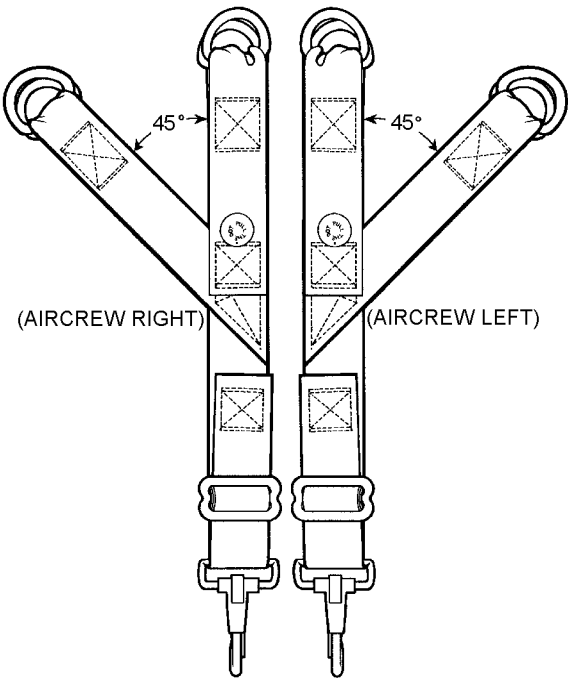


Figure 3-17A. LPU-36/P LPFC Attachment Straps

003017a

NOTE

If armor is worn with the CMU-33A/P22P-18(V) and the life preserver is not large enough, incorporate life preserver extension panel in accordance with NAVAIR 13-1-6.1-2. Waist lobes will be attached in the same manner as described in the following procedures with the exception that the life preserver will be attached using only one or two locations on each side of the life preserver vice two or three.

Materials Required

Quantity	Description	Reference Number
As Required	Insulation Sleeving, Electrical	MIL-I-23053/5 NIIN 00-815-1300

- 1. For all LPU-21s, LPU-23s, and LPU-27s, except LPU-21D/P and LPU-35/P.
 - a. Lay vest with inside facing down. Lay life preserver in place on top of vest.
 - b. Attach the six vest waist lobe attachment straps by reeving them up between the vertical webbing and behind the horizontal webbing of the life preserver, then thru the vest's second row of loops from the bottom. Fold waist lobe attachment straps over and snap to themselves.

2. For LPU-21D/P and LPU-35/P only.

a. Fabricate waist lobe attachment straps, if necessary, in accordance with paragraph 3-47.

b. Unsnap the first and last vest waist lobe attachment straps. Reeve vest waist lobe attachment strap nearest zipper up thru loop of fabricated strap, thru the vest's second row of loops from the bottom, fold onto itself and snap to itself. Reeve fabricated strap thru vertical webbing on life preserver, then under second inboard waist lobe attachment strap from zipper, and thru next vertical webbing on the life preserver. Reeve last waist lobe attachment strap thru other loop of fabricated strap, thru the vest's second row of loops from the bottom, fold onto itself and snap to itself.

c. Repeat step 2b for other side of vest.

3. Prior to attaching collar lobe snap hooks to D-ring:

a. Cut two pieces of the electrical insulation sleeving, (heat shrink) MIL-I-23053/5, 2.75 inches in length.

b. Slide one piece of the heat shrink cut in step a over one of the D-rings of the survival vest attachment strap and connect the life preserver snap hook to the D-ring.

c. Slide the heat shrink up and over the life preserver snap hook. Ensure the heat shrink butts against the shank (base) of the snap hook.



Ensure heat from the heat gun is not directed to the bladder of the life preserver. Testing has indicated direct heat from the heat gun will not harm the bladder, but it shall be avoided.

d. Apply heat from the heat gun until the heat shrink is snug around the snap hook. The heat shrink should cover the spring clip opening of the snap hook completely.

e. Repeat steps 3b thru 3d for the snap hook on the opposite side.

f. Inspect both snap hooks modified in steps 3b thru 3d to ensure the heat shrink is snug around the snap hooks and covers the snap hook spring clip opening completely.

g. Snap retaining straps of life preserver collar lobes around survival vest material.

h. Don survival vest and life preserver as one assembly.

3-49. LPU-34/P AND LPU-37/P LOW PROFILE FLOTATION COLLAR (LPFC) ATTACHMENT.

Materials Required

Quantity	Description	Reference Number
As Required	Thread, Nylon, Size E	V-T-295 NIIN 00-204-3884
As Required	Webbing, Nylon, Type IV, 1 inch wide	MIL-T-5038 NIIN 00-261-8579
4 each	D-ring, 3/4 inch	MS51925-2 NIIN 00-202-0228

1. Attach LPU-34/P or LPU-37/P D-ring attachment to CMU-33A/P22P-18(V) hoisting harness as follows:

NOTE

All stitching is to be performed with a Type 301 stitch, 8 to 10 stitches per inch, over stitch 3/4 inch.

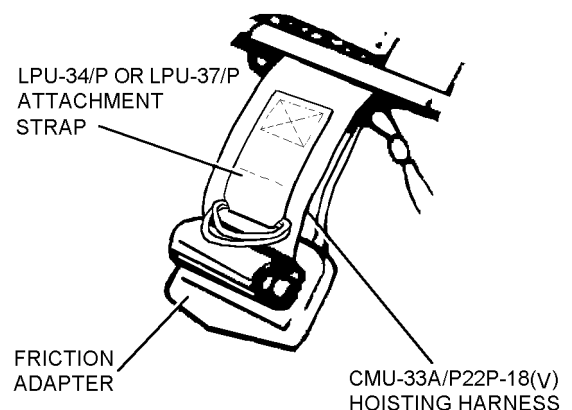
a. Remove hoisting harness from CMU-33A/P22P-18(V) Type I vest.

b. Cut and sear two 6-inch lengths of Type IV nylon webbing.

c. Thread two D-rings onto each of the 6-inch lengths.

d. Fold in half aligning ends.

e. Place webbing with D-rings on front leg straps of hoisting harness just above friction adapter.

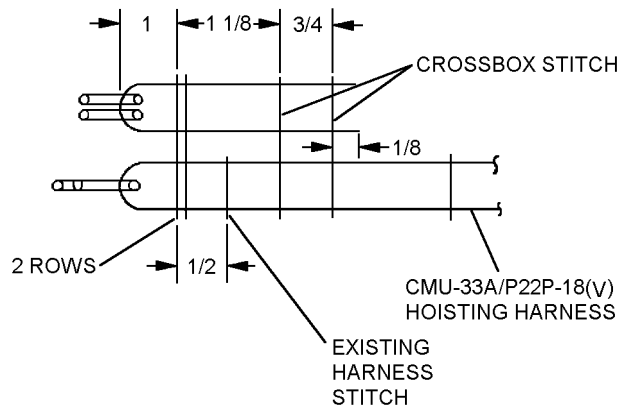


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Step 1e - Para 3-49

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f. Attach webbing with D-rings to harness using a crossbox stitch with size E nylon thread. Sew D-ring end of webbing to hoisting harness using two rows of straight stitches located 1/2 inch from existing stitches on harness.



674-063

Step 1f - Para 3-49

g. Reinstall hoisting harness into vest in accordance with paragraph 3-37.

NOTE

It is critical to remove all excess strap from the packed life preserver by firmly pulling on the four attachment straps prior to proceeding with step 2.

2. Place LPFC around aircrewmember's neck and connect chest strap (FASTEX fastener).

NOTE

The LPFC back attachment straps must be attached and adjusted before attaching front straps.

3. While the aircrewmember holds the LPFC front lobes in place, fold the back lobe over towards the aircrewmember's back and hold in position against the survival vest, allowing at least 1 inch between the aircrewmember's neck and the back lobe. Ensure the narrow portion of the front lobes aligned with the aircrewmember's neck.

4. While the collar portion of the LPFC is held snugly in place against the aircrewmember's back, thread the LPFC attachment strap through the next lower vest loop from where the strap exits the LPFC outer case/grommet. It is crucial to ensure the strap is threaded tight enough to hold the LPFC down, tightly against the survival vest.

5. Thread the strap through the same vest loop twice to form a double wrap-around.

6. Tie a half-hitch knot in the strap above the double wrap-around.

7. Using waxed size E thread, two turns single, tack the attachment strap through the half-hitch knot to prevent slippage and tie with surgeon's knot followed by a square knot and a binder's knot. Repeat steps 4, 5, 6, and 7 for the other LPFC attachment strap.

8. Route remaining portions of attachment straps through vest loops and tack if necessary.

9. While the front portion of the LPFC is held snugly against the aircrewmember's chest, route one forward LPFC attachment strap through the next lower vest loop from where the strap exits the LPFC outer case/grommet. It is crucial to ensure the strap is threaded tight enough to hold the LPFC down, tightly against the survival vest.

10. Form a single loop around the vest loop.

11. Route remaining length of the LPFC attachment strap through the vest loops to the D-rings of the Type I vest hoisting harness.

12. Route the attachment strap through both D-rings and back through the top D-ring to where the attachment strap first appears between the rows of vest loops.

13. Tie a half-hitch around the LPFC attachment strap between the two rows of vest loops using waxed size E thread, two turns single, tack through the knot to prevent slippage. Tie with a surgeon's knot followed by a square knot and binder's knot. Repeat steps 9 through 13 for the other LPFC attachment strap.

14. Route remaining attachment strap through vest loops and tack if required.

15. Reeve container hold down strap upward through vest loop near collar bone and snap to container.

16. Verify LPFC attachment.

3-50. LPU-36/P LOW PROFILE FLOTATION COLLAR (LPFC) ATTACHMENT. Don and attach LPFC as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Thread, Nylon, Size E	V-T-295 NIIN 00-204-3884

1. With the aircrewmembers wearing their torso harness and Airsave survival vest, properly fitted and adjusted in accordance with the NAVAIR 13-1-6.7 series technical manuals, note the position of the life preserver attaching D-rings, installed on the torso harness.

2. Snap the dog snaps of both life preserver attachment straps to the torso harness D-rings by inserting the dog snaps down through the row "A" loops of the survival vest, directly above the torso harness D-rings and hook the snaps to the D-rings. Reeve the remainder of the attachment straps up under the survival vest loops to their front and rear positions and snap the anchor straps in place over the vest attachment loops.

NOTE

It is critical to remove all excess strap from the packed life preserver by firmly pulling on the four attachment straps prior to proceeding with step 3.

3. Place the LPU-36/P around the aircrewmember's neck and connect the chest strap (FASTEX fastener).

NOTE

Attachment and adjustment of the LPU-36/P back straps must be completed before attaching the front straps.

4. While the aircrewmember holds the LPU-36/P front lobes in place, fold the back lobe over towards the aircrewmember's back and hold in position against the survival vest, allowing at least 1 inch between the aircrewmember's neck and the back lobe. Ensure the narrow portion of the front lobes aligned with the aircrewmember's neck.

5. While the collar portion of the LPU-36/P is held snugly in place against the aircrewmember's back, thread the LPU-36/P attachment strap through the next lower vest loop from where the strap exits the LPFC outer case/grommet. It is crucial to ensure the strap is threaded tight enough to hold the LPU-36/P down tightly against the survival vest. Thread the strap through the same vest loop twice to form a double wrap-around.

6. Tie a half hitch knot in the strap above the double wrap-around.

7. Using two turns waxed, size E thread double, tack the attachment strap through the half-hitch and tie the tacking off using a surgeon's knot followed with a square knot and a binder's knot.

8. Reeve the remainder of the LPU-36/P attachment strap beneath the survival vest attachment loops and angled to the rear (45 degree angled) life preserver attachment strap D-rings. Repeat steps 4 thru 8 for the other back LPU-36/P attachment strap.

9. While the front portion of the LPU-36/P is held snugly against the aircrewmember's chest, route one forward LPU-36/P attachment strap through the next lower vest loop from where the strap exits the LPU-36/P outer case/grommet. It is crucial to ensure the strap is threaded tight enough to hold the LPU-36/P down, tightly against the survival vest.

10. Wrap the attachment strap around the same vest loop to form a single loop.

11. Reeve the attachment strap under survival vest attachment loops and downward to the life preserver front attachment strap D-rings. Repeat steps 9 thru 11 for the other forward LPU-36/P attachment strap.

12. Attach all four LPU-36/P attachment straps through the life preserver attachment straps D-rings by threading the LPU-36/P attachment straps through both D-rings then back through one D-ring. After the webbing is threaded through the D-rings, tack through the D-rings with two turns of waxed size E thread single, and tie off with a surgeon's knot followed with a square knot and a binder's knot, to prevent slippage. Secure remaining LPU-36/P attachment strap webbing by rolling the straps and securing them with a lightweight rubber band and tuck the roll under an unused vest loop.

13. Adjust the ladder loop to remove any slack in the life preserver attachment strap and secure the adjustment by routing the strap back through the ladder loop and tacking the adjustment with two turns of waxed E thread single and tie off with a surgeon's knot, followed with a square knot and a binder's knot.

14. Reeve container hold down strap upward through vest loops near collarbone and snap to container.

15. Verify LPU-36/P attachment.

3-50A. MODIFICATION FOR ACCOMMODATION OF A HANDS-FREE HYDRATION SYSTEM.

1. Lay vest out on table, with inside pockets facing up. Locate inside pockets on side of vest aircrewmember desires incorporation of hydration system.

2. Remove all gear from both upper and lower inside pockets.

3. Open flap on lower inside pocket and identify the lower one row of stitches that attaches binding tape to mesh.

4. Using care not to cut the outer mesh, remove stitches that secure binding tape and flap to the mesh, from binding tape along zipper edge to opposite side edge of pocket flap.

5. Upper and lower pockets should now be as one.

NOTE

Hands-Free Hydration System may be inserted into this pocket. Drinking hose may be stowed in pocket or may be routed from under pocket flap to neck area and secured to vest by routing hose through available loop on outside of vest. Tie wrap bite valve to hose. Hose may be shortened to accommodate the individual user. This modification allows for a maximum 50-oz. hydration system.

3-50B. MODIFICATION FOR CONFLICTING FITS WITH THE COUNTER PRESSURE VEST.

To modify the counter pressure vest for conflicting fits, proceed as follows:

Materials Required

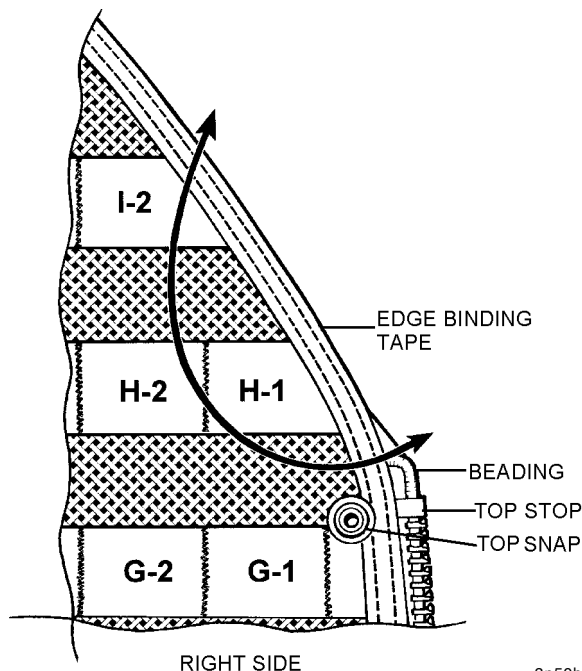
Quantity	Description	Reference Number
As Required	Tape, Nylon, Type III	NIIN 00-753-6144
As Required	Thread, Nylon, Size E	V-T-295 NIIN 00-204-3884

NOTE

All stitching shall be Type 301 lockstitch, 8 to 10 stitches per inch using size E nylon thread. Overstitch 1 inch wherever possible.

This modification shall be accomplished only in extreme cases where the supply hose for the counter pressure vest is covered by the mesh fabric of the survival vest.

1. Using template as pattern, mark mesh fabric to be removed, using grease pencil, ink or chalk.



Step 1 - Para 3-50B

2. Sew over the marked line with a single row of stitching.

3. Cut away mesh fabric, attachment loops and seam tape, 1/8 inch outboard from marked line. Ensure adequate room remains above slide fastener top stop to allow for installation of binding tape.

4. Sew 1-inch Type III Nylon tape around edge of cut out area, using 2 rows of stitching, 1/8 inch and 3/8 inch from edge, to prevent fraying of mesh material.

3-50C. MODIFICATION FOR INSTALLATION OF JOINT HELMET MOUNTED CUEING SYSTEM (JHMCS), QUICK MOUNTING BRACKET ACCESS.

To modify for installation of the Joint Helmet Mounted Cueing System (JHMCS), Quick Mounting Bracket Access, proceed as follows:

Materials Required

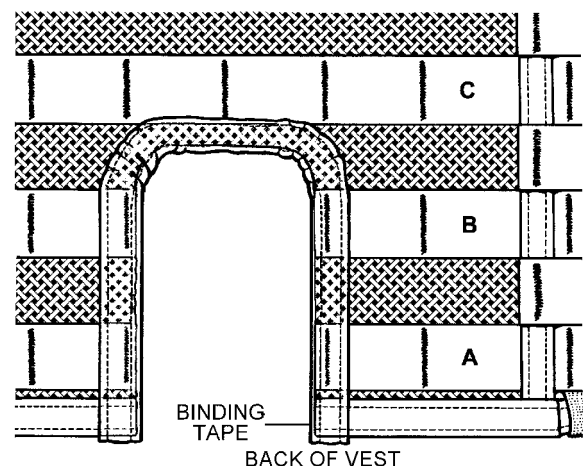
Quantity	Description	Reference Number
As Required	Tape, Nylon, Type III	NIIN 00-753-6144
As Required	Thread, Nylon, Size E	V-T-295 NIIN 00-204-3884

NOTE

All stitching shall be Type 301 lockstitch, 8 to 10 stitches per inch using size E nylon thread. Overstitch 1 inch wherever possible.

Remove no more than 2 rows of attachment loop webbing and no more than two attachment loops in width.

1. Using grease pencil, ink or chalk, mark mesh fabric to be removed, rounding both upper, inside corners. Sew over the marked line with a single row of stitching.



Step 1 - Para 3-50C

NOTE

Ensure adequate room remains below the next row of attachment loop webbing for the installation of the 1-inch Nylon binding tape.

While removing attaching loops, ensure bar tackings are left intact to maintain attachment loop integrity.

2. Cut away mesh fabric and seam tape, 1/8 inch outboard from marked line.

3. Sew 1-inch, Type III, Nylon tape, around edge of cut out area. Use 2 rows of stitching, 1/8 inch and 3/8 inch from edge, to prevent fraying of mesh material.

3-50D. INTEGRATION OF THE TYPE II SURVIVAL VEST TO THE INTEGRATED TORSO HARNESS ASSEMBLY. To secure the Type II survival vest to the integrated torso harness, proceed as follows:

NOTE

Integration of the Type II vest to the integrated torso harness is at the aircrewmember's discretion.

1. Lay the survival vest on a flat surface with the front of the vest open and facing up.

2. Lay the integrated torso harness, in the same orientation, inside the opened Type II survival vest, with the entrance zipper also in the opened position.

3. Insert the parachute attachment fittings and gated D-ring through the slots in the front of the vest, between Rows F and G (figure 3-5).

4. Route the six harness retaining straps around the integrated torso harness shoulder straps and secure the retaining straps in place by snapping them closed over the torso harness shoulder straps.

5. Thread the harness retainer cords, located on the bottom front, left, and right sides of the vest, around the main sling on each corresponding side of the torso harness. Tie ends together with a surgeon's knot followed by a square knot.

3-51. ATTACHMENT OF U.S. ARMY MK-48 LIGHTWEIGHT MOTOR BLOWER (LWMB). The MK-48 LWMB is attached as follows:

Materials Required

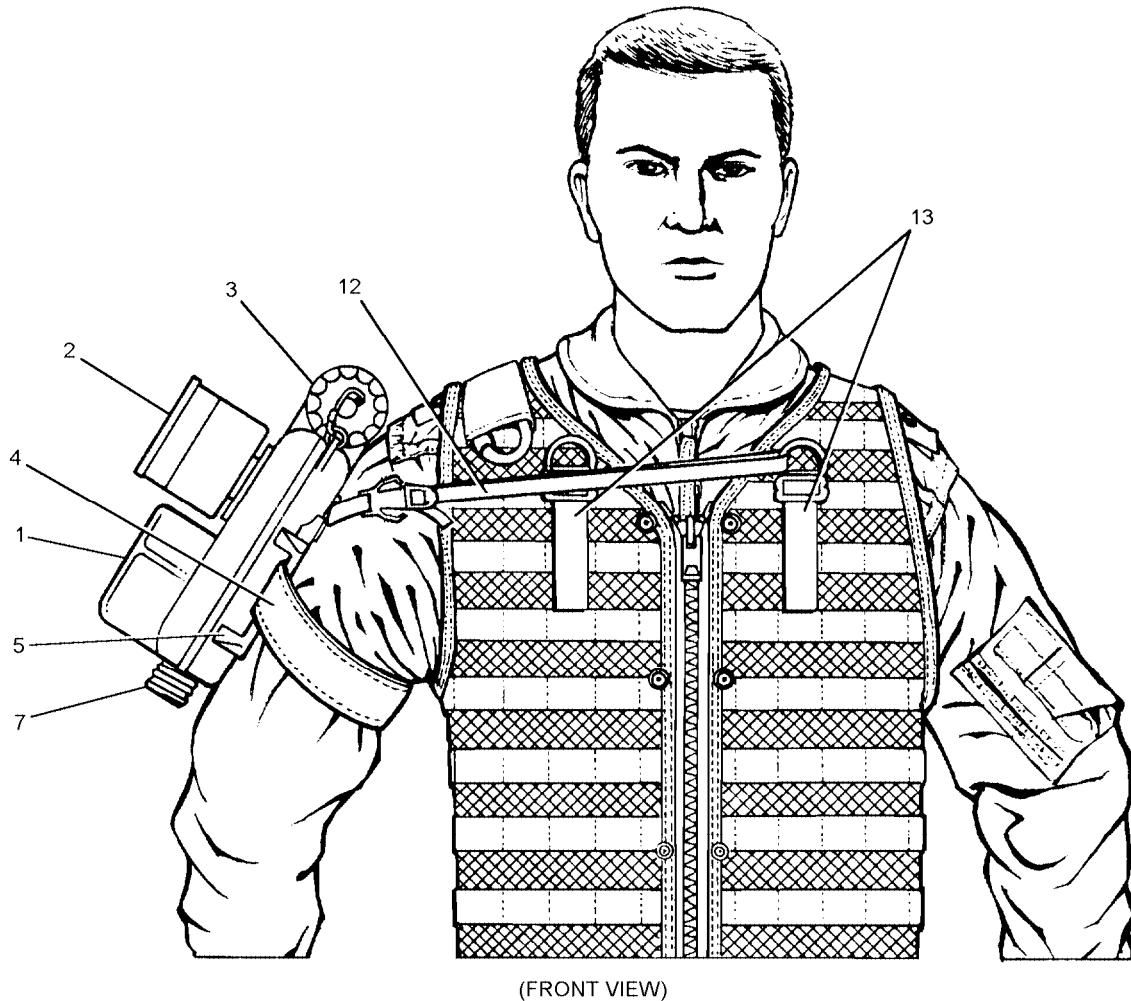
Quantity	Description	Reference Number
1	Survival Vest Modification Kit	P/N 5-1-3368

1. Don survival equipment.

2. Remove blower (1, figure 3-30) from mask carrier.

3. If the blower does not run, install new battery before proceeding. If the blower assembly still does not operate, return to supply.

4. Place blower with canisters (2) facing down and battery compartment (3) away from body.



(FRONT VIEW)

674-039

Figure 3-30. Attachment of Army MK-48 Light Weight Blower Motor (LWBM) (Sheet 1 of 2)**NOTE**

The blower is mounted on the pilot's left arm with the arm band attached to the right loop of the blower and is mounted on the right arm of the copilot/gunner with the arm band attached to the left loop of the blower.

5. Feed tab end of arm band (4) through blower loop (5) with hook and pile facing blower.

6. Loop tab end of arm band and through attached slide (6). Pull arm band through slide until slide is secure against blower loop.

7. Insert tab end of arm band through opposite blower loop allowing room for arm.

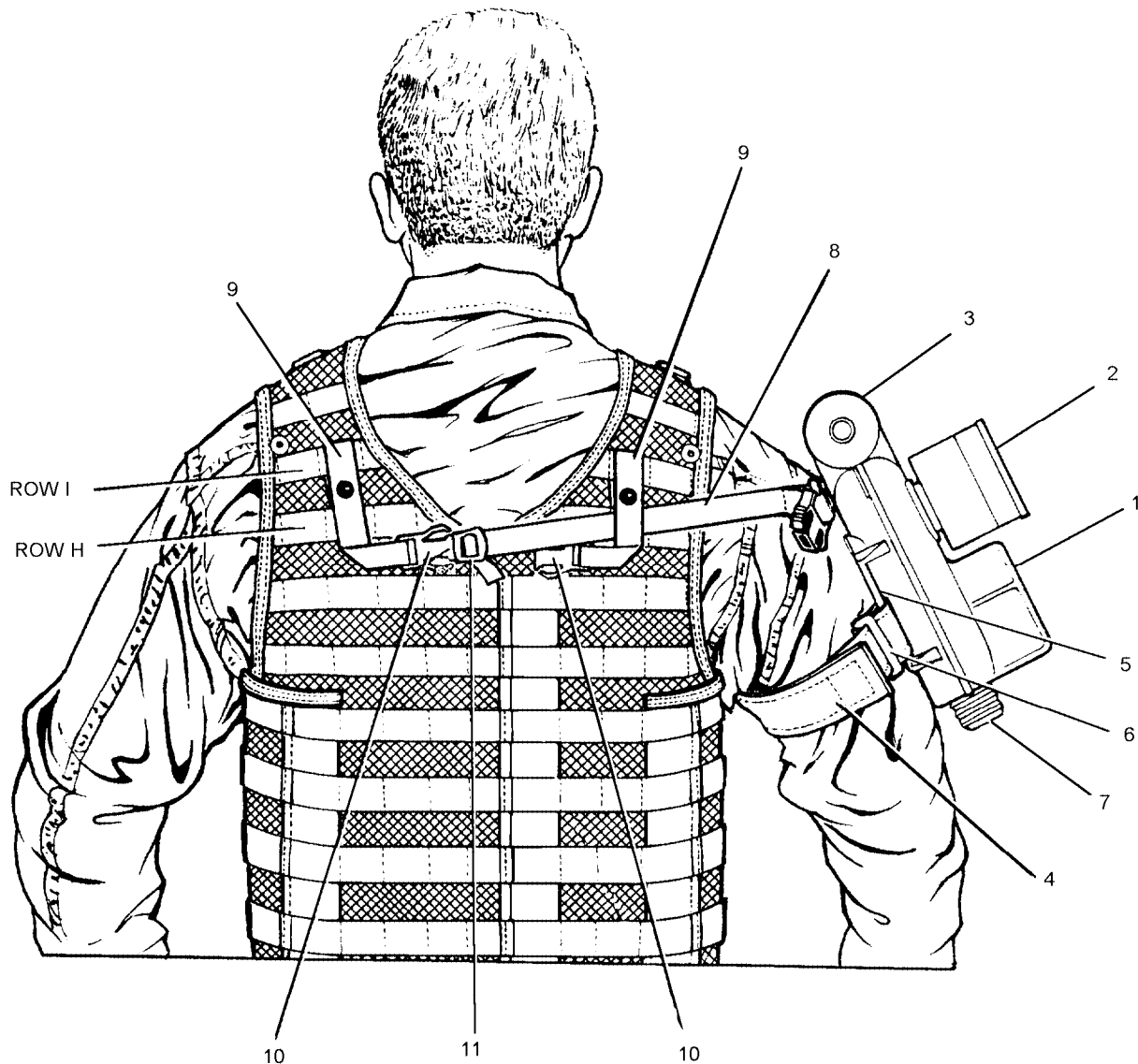
8. The clip (11) on left and right shoulder blade straps (9) should face toward the rear center of the vest ([figure 3-30](#)).

9. For left shoulder installation, slide unfastened shoulder strap under vest webbing loops in rows H and I.

10. Fold strap over and snap to secure.

11. For right shoulder installation, slide short end of strap under webbing loop in row H of vest and longer strap over row I.

12. Snap will be under rows I and H facing the vest. Snap to secure.



(BACK VIEW)

- | | | |
|------------------------|-------------------------|--------------------------------|
| 1. BLOWER | 6. SLIDE | 10. BUCKLE |
| 2. CANISTER (2) | 7. BLOWER OUTLET PORT | 11. CLIP |
| 3. BATTERY COMPARTMENT | 8. BACK BLOWER STRAP | 12. FRONT BLOWER STRAP |
| 4. ARM BAND | 9. SHOULDER BLADE STRAP | 13. LPU COLLAR LOBE ATTACHMENT |
| 5. BLOWER LOOP (2) | | |

(COPILOT/GUNNER CONFIGURATION SHOWN)

674-056

Figure 3-30. Attachment of Army MK-48 Light Weight Blower Motor (LWBM) (Sheet 2 of 2)

13. Two LPU collar lobe attachment straps will be required. Fabricate as required in accordance with [paragraph 3-34](#).

14. With blower outlet port (7) pointing down, insert arm through loop of attached arm band and slide blower onto upper arm.

15. Grasp tab end of arm band and secure with hook and pile.

16. Feed back strap (8) from blower, with clip (11) attached, through loop of shoulder blade strap (9) and attach clip to buckle (10) of opposite shoulder blade strap.

17. Feed front blower strap (12) through LPU D-ring (13) on opposite side of chest and attach to matching buckle on LWMB. Tighten blower straps.

18. Refer to TM 3-4240-342-10 for instructions on the use of the M48 Apache Aviator Mask.

3-52. ATTACHMENT OF U.S. ARMY MK-49 LIGHTWEIGHT BLOWER MOTOR (LWBM).

NOTE

One LPU collar lobe attachment is required to interface with the M49 Mask.

Do not take any carriers into aircraft.

1. Don survival equipment.

2. Remove blower (1, [figure 3-31](#)) from mask carrier.

3. Place blower with canisters (2) facing down and battery compartment (3) on left.

4. Grasp buckle (4) on mounting strap (5) nearest battery compartment; extend strap over shoulder and loop strap (5) over and under second webbing loop of row I on back of vest. Slide strap (5) under webbing loop in row J and back over shoulder to front of vest and attach to mating clip on motor.

5. Grasp chest strap (6) nearest to blower outlet port (11) and attach snap (8) to LPU D-ring on front right side of vest.

6. Grasp buckle (10) of shoulder strap (9), loop over and under webbing loop in row E on left front of vest. Slide strap (9) through and attach buckle (10) to mating clip on lower part of blower.

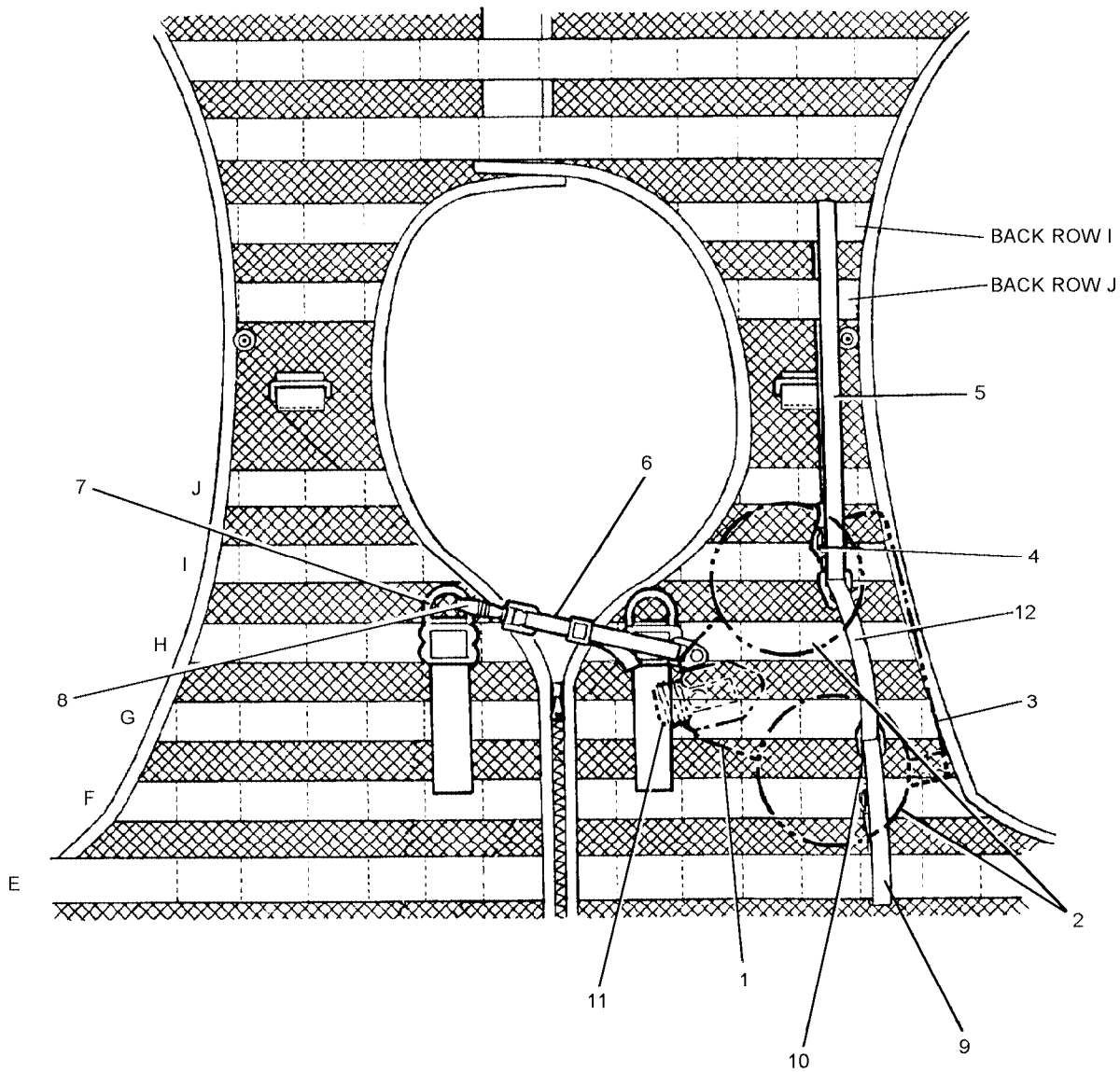
7. Refer to TM 3-4240-342-10 for instructions on the use of the M49 General Aviator Mask.

Section 3-3. Small Arms Protective Soft Armor, PRU-60A/P22P-15, and Small Arms Protective Hard Body Armor, PRU-61A/P22P-15

3-53. GENERAL.

3-54. The Small Arms Protective Soft Body Armor, PRU-60A/P22P-15, of the Protective Assembly, Aircrew Survival - Armor A/P22P-18(V) provides aircrew members with protection against high-velocity, anti-aircraft shrapnel. The Hard Small Arms Protective Body Armor, PRU-61A/P22P-15, will provide increased protection for vital organs of the torso against .30 caliber armor piercing rounds. The Army hard armor plate provides standoff protection against .50 caliber armor piercing rounds. If the CMU-33A/P22P-18(V) vest is not worn, the soft armor may be

worn using the front or back sections. If only the front soft armor is desired for protection in aircrew positions with armored seats, the Kevlar insert is removed from the back casing and stowed for future use. The front hard armor may be worn without the back hard armor, but the front hard armor depends upon the soft armor casing as a carrier. Therefore the soft armor must be worn in order to wear the .30 caliber front hard armor. The Army .50 caliber plate may not be worn with the soft armor. Also, the vest must be worn in order to wear both the front and back hard armor because of the necessary quick disconnect and back armor retaining straps.



- | | |
|--------------------------------|-------------------------|
| 1. BLOWER | 8. SNAPHOOK |
| 2. CANISTER (2) | 9. SHOULDER BLADE STRAP |
| 3. BATTERY COMPARTMENT | 10. BUCKLE |
| 4. BUCKLE | 11. BLOWER OUTLET PORT |
| 5. MOUNTING STRAP (LOOP STRAP) | 12. MOTOR STRAP |
| 6. CHEST STRAP | |
| 7. LPU D-RING (2) | |

674-040

Figure 3-31. Attachment of Army MK-49 Light Weight Blower Motor (LWBM)

3-55. The soft and hard armor must be ordered separately. The hard armor may be ordered as an entire assembly consisting of front and back hard armor or in a front armor configuration only. The soft armor may be ordered only as a complete unit consisting of front and back soft armor. Replacements for the hard armor inserts, which are the same for the front and the back, may be procured as required. Replacement of any fabric components of the hard armor assembly must be fabricated. Damaged hard armor inserts shall be forwarded to Intermediate maintenance for inspection and disposition. Damaged soft armor inserts shall be discarded.

3-56. CONFIGURATION.

3-57. The soft ballistic inserts are made of multi-layered, ballistic, high-strength Kevlar cloth encased in water repellent nylon covers. Inserts are placed inside the casings. The soft ballistic insert assemblies provide wrap-around coverage and some fragmentation protection for the upper body. Casings are fitted to the aircrewmember by shoulder and side straps using hook and pile fasteners. Soft armor assemblies are available in medium and large sizes. If wearing only the front soft armor is desired, the back soft ballistic insert assembly should be removed from the back casing and stored for future contingencies. The back casing is necessary to connect the front soft small arms protective body armor across the aircrew member's back using the hook and pile attachments. The casing cover for the soft ballistic armor is made of oxford aramid MIL-C-24931. Inside the casing, the ballistic nylon is covered by a water-repellent, plain weave, rip-stop nylon, MIL-C-43637, which also lends protection for the soft armor against the harmful effects of the sun's ultra-violet (UV) rays.

3-58. The hard ballistic inserts are constructed of a ceramic, composite material and a nylon spall shield. The nylon spall shield will effectively contain most projectiles and provides a high degree of anti-fracturing for the ceramic. The front hard ballistic armor fits into a material lip on the front of the soft armor casing assembly and is secured by hook tape on the back of the encasement. The back hard ballistic armor has a quick-disconnect system of straps which attach to the front of the CMU-33A/P22P-18(V) vest with a beaded pull-handle for ease of release. This system was designed for a one-hand, two-operation actuation for removal of the hard armor. The PRU-61A/P22P-15 Hard Body Armor Assembly has two straps which fold over the bottom

of the back hard armor. The straps provide support and security for the back hard armor by pressing the hook tape on the back of the vest, hard armor, and support straps to the pile tape on the hard armor encasement. The front and back hard armor encasements, which cover the hard ballistic inserts, are designed to allow repair of the covers and their components. The hard ballistic armor assemblies come in medium and large sizes. The encasement holding the hard armor inserts is oxford aramid MIL-C-24931.

3-59. The Army .50 caliber plate comes in a carrier that fits under the survival vest. It is a stand-alone system that may be used with the Survival Vest, but is not designed to be used with the soft armor ensemble. Unlike the .30 caliber hard armor, the chest strap of the vest goes over the .50 caliber armor. The carrier for the .50 caliber armor plate is made of plain weave aramid cloth, MIL-C-43842. The armor plate is made of nomex with three sheets of Kevlar inside the front as a spall liner.

3-60. For a breakdown of the components of the protective body armor assemblies, refer to Illustrated Parts Breakdown [figures 3-41](#) and [3-42](#).

3-61. APPLICATION.

3-62. The PRU-60A/P22P-15 Small Arms Protective Soft Body Armor and PRU-61A/P22P-15 Small Arms Protective Hard Body Armor ([figure 3-32](#)) were designed to provide body armor protection for aircrews flying over hostile territory. When aircrew positions have back and side armored seats, aircrew may decide to wear only the front soft armor and front hard ballistic inserts as desired. Otherwise, the full soft armor ensemble and both front and back hard armor is worn in all crew positions. The soft armor is available to helicopter aircrews operating outside direct combat areas. The Army has a .50 caliber plate which may be worn inside the vest in lieu of the soft armor and .30 caliber hard armor.

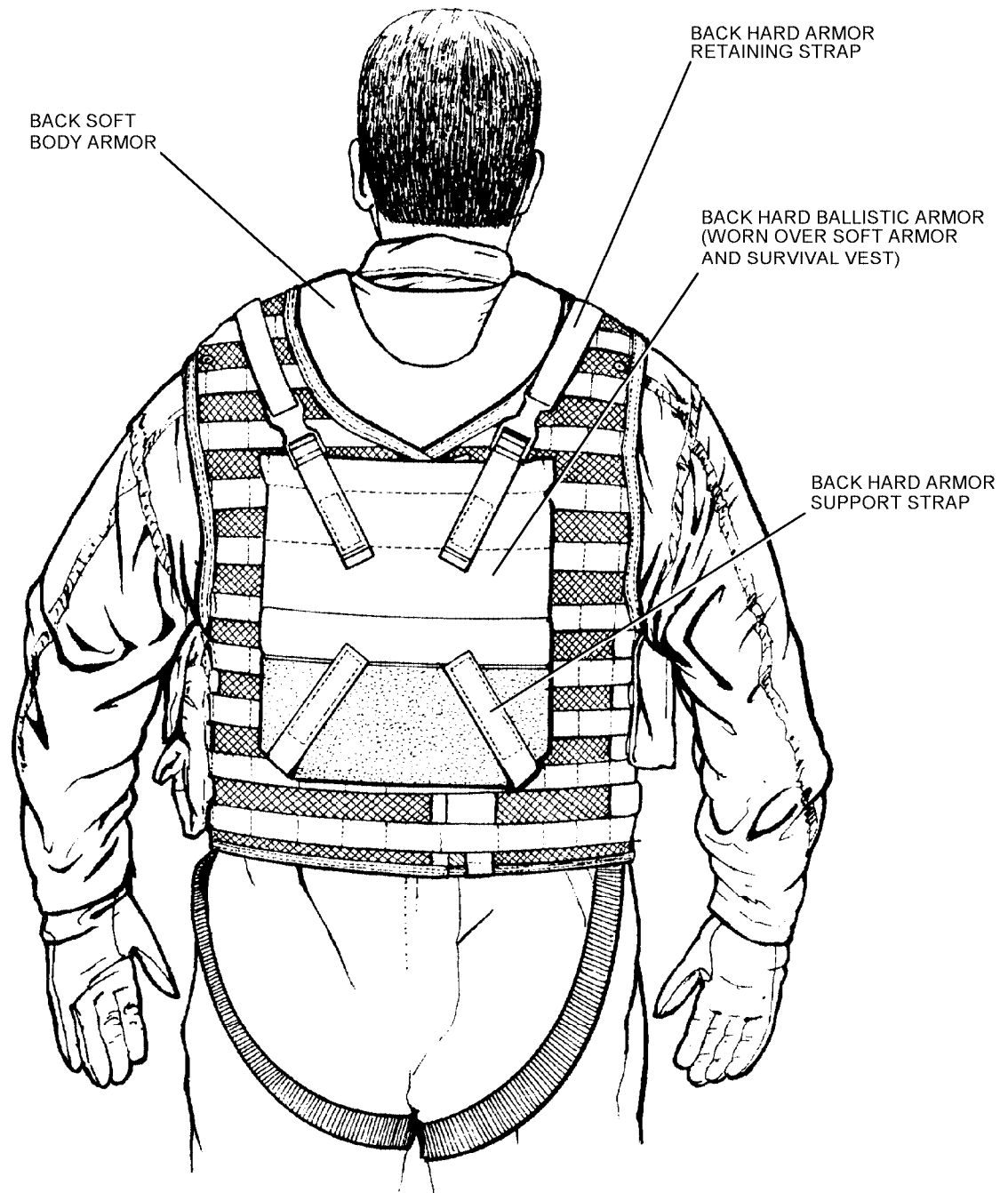
3-63. APPLICABLE CONFIGURATION COMBINATIONS. The following is a breakdown of the applicable configuration combinations of the soft and hard armor assemblies shown in [table 3-6](#).

1. Soft small arms protective body armor assembly (front and back) and hard small arms protective body armor assembly with front and back hard ballistic armor.



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Figure 3-32. Soft and Hard Armor Assemblies PRU-60A/P22P-15 and PRU-61A/P22P-15 (Sheet 1 of 2)



674-057

Figure 3-32. Soft and Hard Armor Assemblies PRU-60A/P22P-15 and PRU-61A/P22P-15 (Sheet 2 of 2)

Table 3-6. Applicable Combinations

Item	Combinations					
	1	2	3	4	5	6
Front Soft Ballistic Insert Assy	X	X	X	X	X	
Back Soft Ballistic Insert Assy	X	X	X			
Front Hard Armor Plate (.30 Cal)	X	X		X		
Back Hard Armor Plate (.30 Cal)	X					
Front Soft Casing Assy	X	X	X	X	X	
Back Soft Casing Assy	X	X	X	X	X	
Army .50 Cal Hard Armor Plate						X

2. Soft small arms protective body armor assembly (front and back) and front hard ballistic armor assembly.

3. Soft small arms protective body armor assembly and no hard armor.

4. Soft small arms protective body armor assembly with the front hard armor and the back soft ballistic insert removed.

5. Front soft ballistic insert assembly with no hard armor.

6. U.S. Army SARVIP .50 caliber ensemble (front only); soft armor not authorized with this configuration.

NOTE

The local commander may specify which configuration aircrew members shall wear based upon the particular aircraft flown and type of mission.

3-64. FITTING.

3-65. The body armor system assembly is fitted to the aircrewmember on a best-fit basis, with insert assemblies and plate(s) installed as applicable to the configuration desired. Armor sizes available for the aircrew members for soft and hard armor are indicated in [table 3-7](#).

3-66. FITTING SOFT ARMOR. A properly fitted survival and armor protective assembly will allow soft ballistic inserts to be located so they extend from the waist to the collar bone. The soft armor should lay flat at the waist when the aircrew member sits down, i.e., it should not bunch or crumple. The location of the flexible soft ballistic armor may be adjusted within the limits of the hook and pile attachments. The first consideration in properly fitting the armor is to provide optimum protection, then comfort. Determine armor size the aircrewman should wear and proceed as follows:

1. Have the aircrew member don the soft armor.
2. Adjust hook and pile attachments to obtain best fit.

NOTE

The body armor must fit snugly to the person to provide maximum effective protection and coverage of the torso.

3. If the armor does not fit, try the alternate size. Determine with the help of the aircrewmember which size fits the best with regard to protection first, and then to comfort.

Table 3-7. Soft and Hard Armor Assembly Sizes

Size	Chest (inches)	Centimeters
Medium	36 - 42	91.4 - 106.7
Large	42 - 48	106.7 - 121.9

4. The front soft armor is connected to the rear soft armor by using hook and pile fasteners on the shoulder and each side. Adjust as necessary using the elastic side straps.

NOTE

If only the front soft armor is desired, remove the back soft ballistic insert and store for future use.

5. Have the individual don the vest with hoisting harness. Connect the leg straps and buckle the chest strap of the vest. Close the slide fastener.

3-67. FITTING HARD ARMOR. To fit the hard armor to an individual, determine size and proceed as follows.

NOTE

The hard armor should be the same size as used for the soft armor.

1. Don the soft armor and vest in accordance with [paragraph 3-66](#).

WARNING

The chest strap shall not be placed over the .30 caliber armor plate. (However, the Army .50 caliber plate shall have the chest strap over the .50 caliber carrier and plate.)

2. When donning the vest, locate the chest strap adjustment buckle on the left side of the chest so as not to interfere with the hard armor and to obtain a more comfortable fit. The chest strap should fit loosely in case the harness is used as a lifting harness.

3. Unzip the slide fastener of the vest down to the lowest snap fastener.

4. Insert the front hard ballistic armor insert, together with its encasement cover, in the pocket of the front soft armor casing ([figure 3-32](#)).

NOTE

If the hard armor does not fit well enough to cover the aircrewmember's vital organ areas, try the alternate size. The armor used in the survival and armor protective assembly will be sized to correspond with the casing size. An aircrewmember requiring a medium assembly will use medium sizes of the soft ballistic inserts and hard armor plates.

5. Using the snap fasteners on either side of the slide fastener, attach the pull handle assembly to the front of the vest.

6. If the back hard armor assembly is to be worn, connect the two back hard armor support straps to the back of the vest.

a. Insert one support strap through a vest webbing loop one loop to the right of the centerline of the back of the adjusted vest and the other strap to the left of the centerline ensuring that the hook tape faces toward the aircrewmember. The two support straps should be two webbing loops apart (approximately 2 1/2 inches).

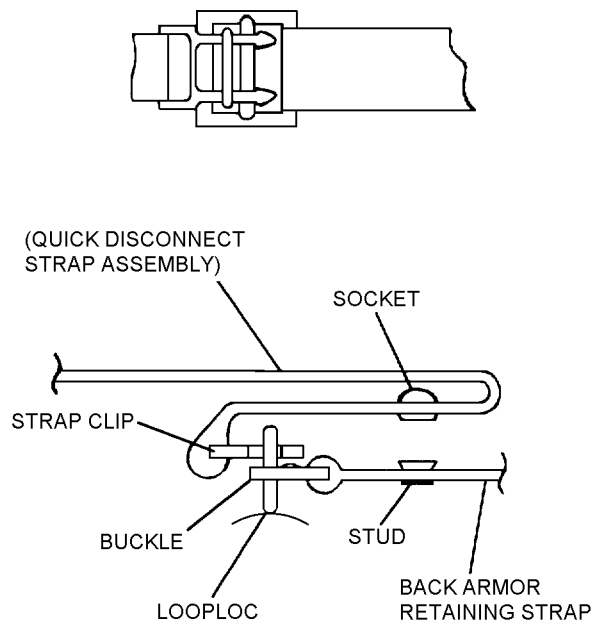
b. Connect the two back armor retaining straps to the back hard armor attachment straps ([figure 3-32](#)).

c. Estimate the aircrewmember's torso length then using one of the four vertical snap fasteners, attach the quick disconnect strap assembly to the top of the pull handle.



d. Place the front loop of the buckle of the back armor retaining straps onto the vest shoulder ring (looploc). Press together the male prongs of the strap clip on the quick disconnect strap assembly, push the clip through the shoulder looploc and release the prongs so the clip snaps in place to hold the retaining strap buckle in position on the looploc.

e. Mate the snap fastener socket on the quick disconnect strap assembly to the stud on the back armor retaining strap so the strap assembly covers the strap clip and shoulder looploc.



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Step 6e - Para 3-67

f. Fold the back hard armor support straps up over the hard armor and press the hook fastener tape of the straps to the pile fastener on the back of the hard armor to support the weight of the armor and properly position the height of the back ballistic hard armor.



NOTE

Donning the hard ballistic armor in this manner enables the aircrewmember to pull the quick disconnect pull handle to release the back hard armor. The front hard armor can then be discarded by grasping the handle sewn to it and pulling it out. Therefore two quick pulls will release both hard armor plates to reduce the weight on the

aircrewmember in an emergency egress situation.

3-68. FITTING ARMY .50 CALIBER ARMOR (Figure 3-33). The Army .50 caliber armor is worn under the CMU-33A/P22P-18(V) vest and comes in sizes small, medium, large, and extra large. To fit the .50 caliber armor, determine the size needed for the aircrewmember and proceed as follows.

NOTE

When determining the size of the armor to be worn, the first consideration is to ensure the best possible coverage for the vital organ area and second to provide the best comfort possible under the circumstances.

1. Have the aircrewmember don a .50 caliber plate carrier containing an armor plate.

a. The top left strap of the carrier goes over the left shoulder, crosses the aircrewmember's back and fastens in the buckle on the bottom right-side of the carrier assembly.

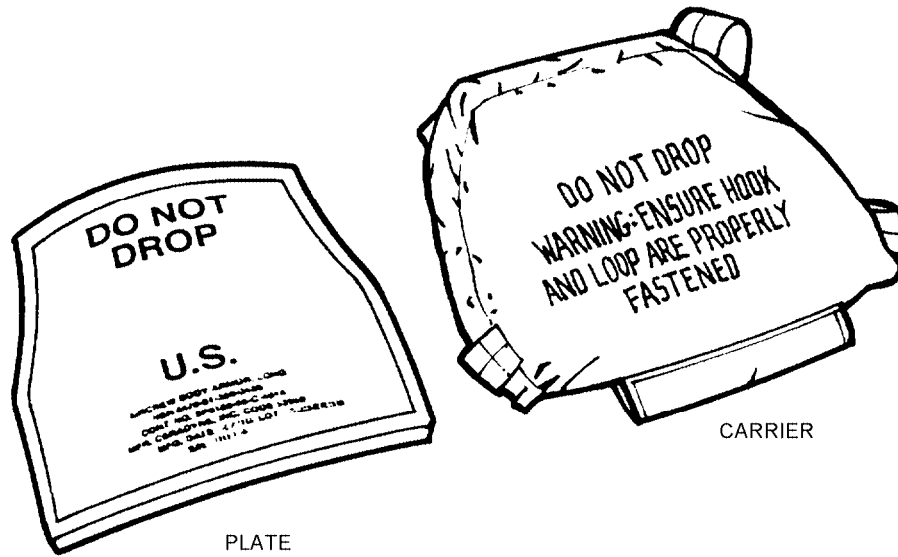
b. The top right strap of the carrier goes over the right shoulder, crosses in back, and fastens in the bottom left buckle.

2. Pull the end of each strap to tighten carrier and adjust fitting. Have the aircrewmember don the survival vest over the armor ensemble.

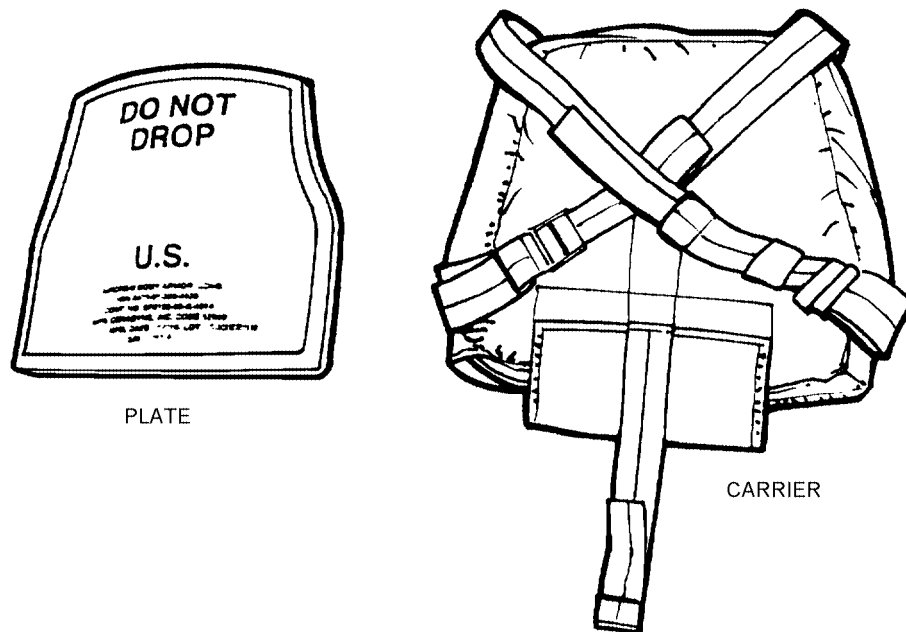
3. Unzip the vest bottom slide fastener about 4 to 5 inches from the bottom to allow easy access to the carrier jettison pull-tab and to allow the armor plate to be pulled out when necessary.

3-69. MAINTENANCE.

3-70. Maintenance of the Small Arms Protective Soft and Hard Body Armor, PRU-60A/P22P-15 and PRU-61A/P22P-15, shall consist of inspections, minor repairs, and fabrications consistent with the requirements of this chapter. Repair actions shall be performed at lowest technically capable maintenance level. If the soft armor ballistic inserts are damaged, they shall be discarded. Damaged hard armor ballistic inserts shall be sent to I-level maintenance for inspection and disposition. All maintenance actions and inspections shall be documented in accordance with OPNAVINST 4790.2 Series/DA Pamphlet 738-751.



(FRONT VIEW)



(BACK VIEW)

Figure 3-33. Army .50 Caliber Armor Assembly (Sheet 1 of 3)

674-042



674-058

Figure 3-33. Army .50 Caliber Armor Assembly (Sheet 2 of 3)



(WITH SURVIVAL VEST)

674-059

Figure 3-33. Army .50 Caliber Armor Assembly (Sheet 3 of 3)

3-71. INSPECTION. Inspection of the Small Arms Protective Soft and Hard Body Armor ensembles shall consist of an Acceptance Inspection prior to being placed into service and a Special Inspection every 90 days thereafter. Preflight and Postflight Inspections shall be performed before and after each flight. Inspections shall be visual inspections performed at the organizational level or above in accordance with [paragraph 3-72](#).

3-72. Visual Inspection. Visual inspection of the Small Arms Protective Soft and Hard Body Armor Assemblies shall be performed as follows.

1. Verify that all components are present and complete.
2. Inspect hard ballistic armor inserts for any evidence of damage, dents, cracks, or any other signs of mishandling.

NOTE

Damaged hard ballistic inserts shall be forwarded to Intermediate Maintenance for inspection and disposition.

3. Inspect soft ballistic insert assemblies for any rips or tears in the water repellent covers or damage to ballistic aramid cloth.

NOTE

Damaged soft ballistic inserts shall be discarded.

4. Inspect soft armor casings and/or the hard armor encasements for cuts, tears, and/or abrasions.
5. Inspect soft armor casings and hard armor encasement stitching for holes, tears, and/or loose seams.
6. Inspect soft armor casings and hard armor encasement hook and pile fasteners for secure attachment and closure.
7. Inspect all soft armor casings and hard armor encasement fasteners for damage, security, and ease of operation.
8. Document inspection in accordance with OP-NAVINST 4790.2 Series/DA Pamphlet 738-751.

3-73. CLEANING. Regular cleaning of the body armor assemblies will lengthen the life of the fabrics.

3-74. Cleaning Soft Ballistic Inserts. Clean soft ballistic inserts as follows:

1. Remove soft ballistic insert assemblies from the casing assembly.

WARNING

Do not soak soft ballistic inserts or use bleach or starch. When wet, untreated aramid cloth could lose up to 40% of its ballistic capability thereby decreasing its protective quality and endangering the safety of the wearer.

2. Use only a damp cloth to wipe the soft ballistic insert cover until clean.

WARNING

Do not leave ballistic aramid cloth exposed to direct sunlight. Continuous exposure to ultraviolet rays for an extensive period of time will seriously deteriorate the soft armor.

3. Allow to dry in open, well ventilated area.

3-75. Cleaning Hard Ballistic Inserts/Army .50 Caliber Plate. Clean hard ballistic armor inserts and Army .50 caliber plate as follows:

1. Remove the hard ballistic armor inserts from their encasements/carrier.
2. Wipe clean with a damp cloth.
3. Dry with a cloth/paper towel or set to air dry.

3-76. Cleaning Casing and Encasement Assemblies and .50 Caliber Carrier.

NOTE

In the following procedures use of the term, casing assembly, will include the soft armor casing assembly, the hard armor encasement, and the Army .50 caliber carrier.

Materials Required

Quantity	Description	Reference Number
As Required	Detergent, Laundry	Commercial

WARNING

Remove all soft ballistic insert assemblies prior to washing the casing assembly. Upon drying, high-strength aramid cloth recovers its original ballistic characteristics. However, water may be retained if the insert is subjected to washing with the casing assembly. When wet, untreated aramid cloth could lose up to 40% of its ballistic capability thereby becoming a threat to the wearer's safety.

1. Ensure all soft ballistic insert assemblies have been removed.
2. Remove loose dirt from hook and pile fastener and outer cover surface using a cloth or soft brush. Do not use a stiff bristle brush.
3. Fasten the hook and pile to prevent entangling with other articles.

WARNING

JP-5 fuel, grease or other combustibles embedded in casing assembly fabric will burn at their normal flash points even though the aramid cloth will not burn until a higher temperature is reached. Be sure the casing assembly is thoroughly clean and free of combustibles prior to further use. Dry clean or machine wash as necessary.

NOTE

Detergent shall be mixed in accordance with instructions on detergent container. Wash casing assembly only with other high temperature resistant, flame retardant materials (textile aramid flame retardant).

Heavily soiled and/or stained casing assemblies may require high-temperature water for best cleaning. Casing assemblies that are heavily soiled and/or stained with oil or grease may be pre-treated with a commercial pre-wash detergent.

4. Immerse casing assembly in a proper mixture of a commercial laundry detergent and luke-warm water. Allow casing assembly to soak for five minutes. Agitate gently (by hand) for two minutes and drain water.

5. Rinse casing assembly in cool, fresh water and drain the water. Repeat rinsing until all traces of detergent have disappeared from the rinse water.

CAUTION

Do not dry casing assembly in direct sunlight.

6. Hang casing assembly on a wooden hanger to dry in a dry, well-ventilated area away from heat and any open flame.

3-77. CORRECTIVE MAINTENANCE. Corrective maintenance of the soft and hard body armor assemblies and hard armor plate encasement assemblies shall be limited to the general maintenance instructions in accordance with [paragraph 3-69](#).

3-78. No maintenance is authorized on the hard armor plates. If the hard armor plates are dropped or receive other abnormal treatment, or a defect is suspected, they shall be inspected by a nondestructive method at I-level. The I-level inspection will determine type of maintenance and disposition.

CAUTION

The hard body armor is made of fragile ceramic material and must be handled carefully.

1. The hard armor plates shall be inspected before each operational use in accordance with [paragraph 3-72](#) to ensure there are no surface cracks which might degrade ballistic protection. Hard armor plate must be replaced if it is cracked, has been hit, or received rough treatment in any way which may cause damage. For example, if an unprotected hard armor plate hits a hard surface at the speed of 12

feet/second (i.e. a drop from a height equal to one yard onto a tile floor) the armor should be sent to I-level for further inspection by an authorized representative, even if there is no visible damage to the exterior of the plates. The ballistic nylon spall shield which covers the ceramic plates could conceal damage to the ceramic material of the hard armor. Hard armor may be reissued if it is determined to be acceptable by I-level after radiographic inspection in accordance with MIL-STD-453 by an operator qualified in accordance with MIL-R-11470.

2. The soft ballistic inserts must be replaced if the ballistic aramid cloth is damaged.

3. The entire small arms protective soft body armor assembly shall be replaced if damage such as the following is found:

- a. Tears are found in the ballistic aramid cloth.
- b. Badly worn areas in which the thread used to sew layers together is damaged.
- c. There is evidence that the fabric is unraveling.
- 4. Small rips or tears in the rip-stop nylon that covers the soft ballistic insert assemblies may be repaired using any water repellent tape compatible with nylon under the following conditions:

- a. There is no damage to the ballistic aramid cloth.
- b. There is no moisture inside the insert (the ballistic aramid cloth).
- c. The repair material is also water-repellent.
- d. After repair, the insert cover remains water-repellent.

3-79. REPAIR/REPLACEMENT/FABRICATION.

3-80. CASING ASSEMBLY, SOFT AND HARD ARMOR. Repairs on casing assemblies shall be performed at the lowest technically capable maintenance level, using an industrial/medium-duty sewing machine and high temperature-resistant nylon thread. Repairs

shall be limited to mending small rips and tears, restitching loose seams, and replacing fastening devices.

3-81. HOOK AND PILE FASTENER TAPES. Replace hook and pile fastener tapes as follows:

Materials Required		
Quantity	Description	Reference Number
As Required	Fastener Tape, Hook, TY II, Class 1, Olive Green 106, 1 inch and 2 inch	MIL-F-21840 NIIN 00-106-5973 NIIN 00-450-9837
As Required	Fastener Tape, Pile, TY II, Class 1, Olive Green 106, 1 inch and 2 inch	MIL-F-21840 NIIN 00-106-5974 NIIN 00-151-6482
As Required	Thread, Nylon, Size E	V-T-295 NIIN 00-204-3884

- 1. Carefully cut stitching and remove damaged fastener tape.
- 2. Cut new fastener tape the same length as the damaged fastener tape removed.
- 3. Position fastener tape in same location as fastener tape removed. Single row stitch 1/8 inch from edge on all four sides.

3-82. SNAP FASTENERS. Replace defective snap fasteners as follows:

Materials Required		
Quantity	Description	Reference Number
As Required	Fastener, Snap, Omnidirectional, Button,	MS27980-1B NIIN 00-359-6844
As Required	Fastener, Snap, Omnidirectional, Socket	MS27980-6B NIIN 00-285-6250
As Required	Fastener, Snap, Omnidirectional, Stud	MS27980-7B NIIN 00-842-1879
As Required	Fastener, Snap, Omnidirectional, Eyelet	MS27980-8B NIIN 01-023-3843

Materials Required (Cont)

Quantity	Description	Reference Number
As Required	Fastener, Snap, Unidirectional Button	MS27983-1 NIIN 00-891-4907
As Required	Fastener, Snap, Unidirectional Socket	MS27983-2 NIIN 00-893-6243
As Required	Fastener, Snap, Unidirectional Stud	MS27983-3 NIIN 00-276-4908
As Required	Fastener, Snap, Unidirectional Eyelet	MS27983-4 NIIN 00-276-4978
1	DOT Snapmaster	89-M840 (CAGE 13940)
1	Punch and Die Set for Omnidirectional Fastener, Snap	4303, 4403 (CAGE 13940)
1	Punch and Die Set for Unidirectional Fastener, Snap	(4304, 4404) also (CAGE 13940) (4305, 4405)

NOTE

When replacing a defective snap fastener, both the stud and eyelet or socket and button must be replaced.

1. Using end cutters, remove damaged snap fastener stud or socket from mating eyelet or button.

2. Install new fasteners using DOT Snapmaster and punch (4303) and die (4403) set or unidirectional dies.

3-83. ELASTIC COTTON WEBBING. Repair/replace side casing adjustment straps on back section soft armor casing assembly as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Webbing, Cotton, Elastic, Olive Green, Type I, CL 3, 1 1/2-inch	MIL-W-5664
3 inches	Fastener, Tape, Hook, 2-inch, Olive Green	MIL-F-21840 NIIN 00-450-9837
As Required	Thread, Nylon, Size E	V-T-295 NIIN 00-204-3884

NOTE

All stitching shall be performed using Type 301, 8 to 10 stitches per inch. Backstitch 1/2 inch at ends of all stitching.

1. Cut a 16-inch length of 2-inch elastic webbing and a 5-inch length of 2-inch hook tape for each adjustment strap to be replaced.

2. Remove soft armor insert from casing assembly.

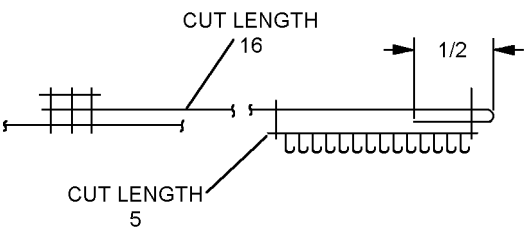
NOTE

Ensure soft ballistic insert from back casing assembly has been removed before attaching adjustment strap.

The back casing assembly is formed by two sections of textile aramid cloth between which the soft ballistic insert is carried. The adjustment strap is to be stitched only to the outer of the two sections.

3. Remove damaged strap from casing assembly by cutting thread, using care not to damage fabric of casing assembly or 3/4-inch webbing sewn on top of strap. Mark casing where strap was removed.

4. Fold end of cotton elastic webbing back 1/2-inch, place 5-inch length of hook tape over the fold-back webbing with end of hook tape flush with folded edge. Stitch hook tape to the cotton elastic webbing using size E nylon thread 1/8 inch from ends of hook tape.



Step 4 - Para 3-83

5. Place end opposite the pile fastener tape of new adjustment strap at marked location where damaged strap was removed. Ensure side of webbing with pile tape attached is facing casing assembly and crossbox stitch 3/4-inch webbing strap back in place.

6. Reinstall soft armor inserts.

3-84. FABRICATION/REPAIR OF PULL HANDLE (Figure 3-34). To fabricate/repair armor beaded pull handle assembly, proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Webbing, Nylon, Type IV, Olive Green, 1-inch	MIL-T-5038 NIIN 00-261-8579
As Required	Webbing, Type XV, Olive Green, 2-inch	MIL-W-4088 NIIN 00-082-2142
As Required	Bead, Flat (Not E)	101270 (CAGE 05DK2)
6	Fastener, Snap, Unidirectional, Button	MS27980-1B NIIN 00-359-6844
6	Fastener, Snap, Unidirectional, Socket	MS27980-6B NIIN 00-285-6250

Materials Required (Cont)

Quantity	Description	Reference Number
2	Fastener, Snap, Omnidirectional, Stud	MS27983-3 NIIN 00-276-4908
2	Fastener, Snap, Omnidirectional, Eyelet	MS27983-4 NIIN 00-276-4978
As Required	Thread, Nylon, Size E	V-T-295 NIIN 00-204-3884
1	DOT Snapmaster	89-M840 (CAGE 13940)
1	Punch and Die Set for Omnidirectional Snap Fastener	4303, 4403 (CAGE 13940)

Notes: 1. The flat beads must be ordered direct from Safety Equipment International (S.E.I), (828) 277-1979 ext. 411.

1. Sear cut one 9 1/2-inch length and one 5 5/8-inch length of MIL-W-43668 1-inch tape.

a. Sear cut one 21-inch length of MIL-W-4088 2-inch webbing.

b. Remove beads from pull handle under repair or use 5 beads from manufacturer or shop stock.

2. Fold 21-inch length of webbing in half to form 10 1/2-inch length. Stitch perimeter 1/16 inch from edge using size E thread.

3. Place 5 3/8-inch length of tape vertical on flat surface.

a. Make a 1 3/8-inch fold from top down toward center and make 1 3/8-inch fold from bottom up toward center so ends meet. The folded tape should now be approximately 2 3/4 inches long.

b. Stitch perimeter of folded tape 1/16 inch from edge using size E thread.

c. Place 9 1/2-inch length of tape perpendicular to and centered on top of 2 3/4-inch tape completed in step 3b above. The right edge of the 2 3/4-inch tape shall be one inch from right end of 9 1/2-inch tape.

d. Sew 9 1/2-inch tape onto 2 3/4-inch tape using 3/4 x 3/4-inch crossbox stitch and size E thread.

4. Place 10 1/2-inch length of 2-inch webbing in horizontal position on flat surface. Measure and mark horizontal center line.

a. Measure and mark 1 1/8-inch from right end of webbing center line.

b. Position 9 1/2-inch assembly formed in step 3d on center line with right edge of 2 3/4-inch tape centered at 1 1/8-inch mark on center line. This will place the right end of 9 1/2-inch tape 1/8 inch from right end of 10 1/2-inch webbing centered on center line of webbing (figure 3-34); single stitch end of tape in place using size E thread.

c. Extend 9 1/2-inch tape to left along center line of webbing and measure and mark tape 3 3/4 inches from right end. Fold tape back at 3 3/4-inch mark toward right, ensure center of tape width is on center line of webbing and double stitch tape to webbing 1/8 inch from fold line using size E thread.

d. Fold end of tape under 1/2 inch, lay flush with sewn end of tape, and boxstitch 5/16 x 3/4 inch staying 1/16 inch from edges.

5. Install/replace snap fasteners (figure 3-34).

a. Position beaded armor pull handle assembly horizontally on flat surface with beaded handle up and to the right.

b. Measure and mark a line 3/8 inch from top and bottom edges across horizontal length of the handle assembly webbing.

c. Starting at right end of each horizontal line drawn in step 5b, measure and mark positions at 3/4 inch, 5 1/4 inches, and 9 3/4 inches.

d. Center punch a hole through the webbing at each of the six positions marked in step 5c. Using DOT Snapmaster and omnidirectional punch and die, install female snap fastener buttons (MS27980-1B) and sockets (MS27980-6B) facing down (buttons on top) at each position.

e. Locate 2 3/4-inch tape secured perpendicular to beaded handle. Measure and mark on center line 1/2 inch from each end.

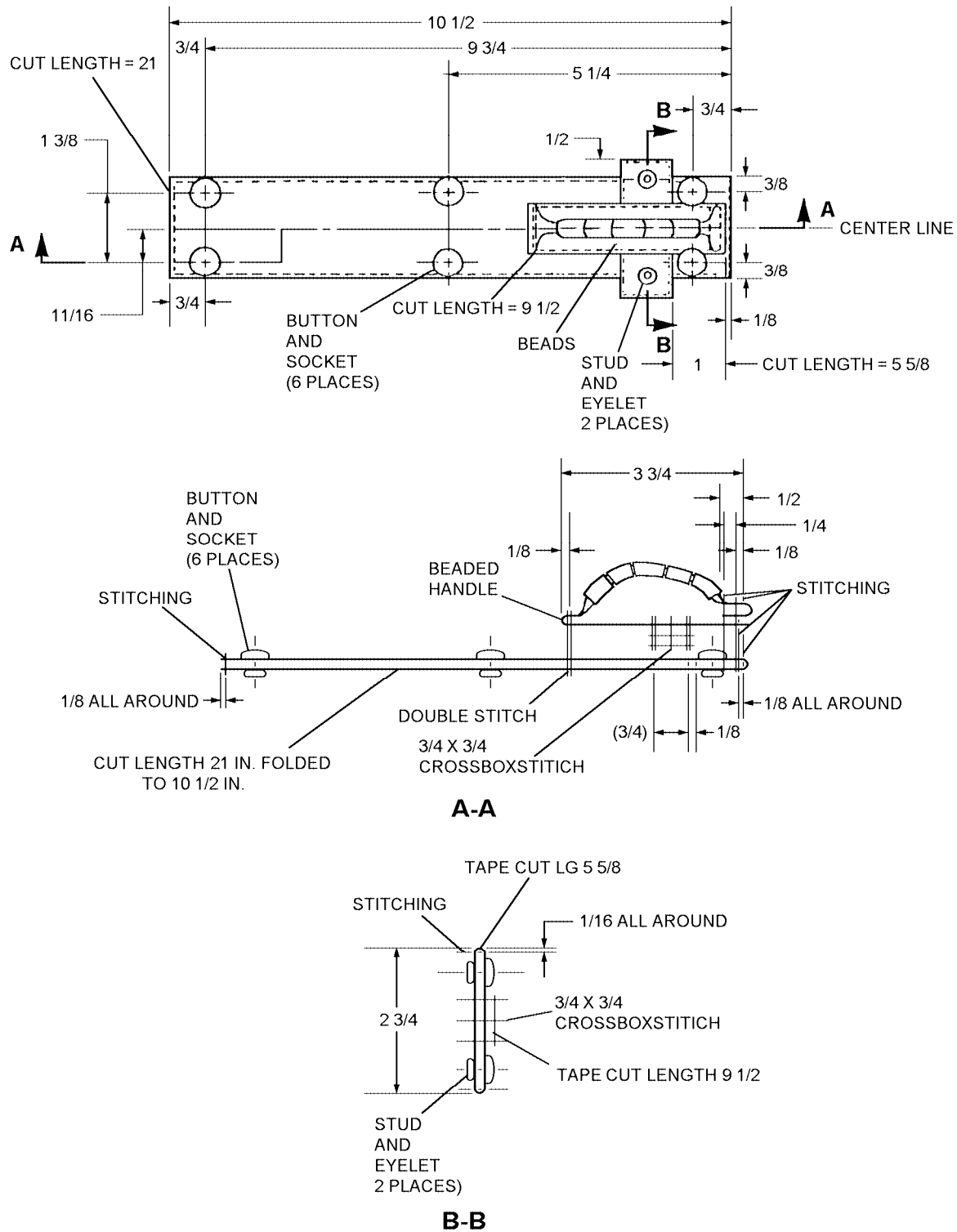
f. Center punch a hole through tape at both positions marked in step 5e. Using DOT Snapmaster and omnidirectional punch and die, install snap fastener stud (MS27983-3) and eyelet (MS27983-4) facing up (eyelet on top) in both positions.

3-85. FABRICATION/REPAIR OF QUICK DISCONNECT STRAP ASSEMBLY. To fabricate/repair quick disconnect strap assembly, refer to figure 3-35 and proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Webbing, Nylon, Type IV, Olive Green, 1-inch	MIL-T-5038 NIIN 00-261-8579
As Required	Thread, Nylon, Size E	V-T-295 NIIN 00-204-3884
1	Fastener, Snap, Omnidirectional, Button	MS27980-1B NIIN 00-359-6844
1	Fastener, Snap, Omnidirectional, Socket	MS27980-6B NIIN 00-285-6250
4	Fastener, Snap, Unidirectional, Button	MS27983-1 NIIN 00-891-9073
4	Fastener, Snap, Unidirectional, Socket	MS27983-2 NIIN 00-893-6243
1	QR Strap Clip, Black, 3/4-inch	627-0075 (CAGE 82399)
1	DOT Snapmaster	89-M840 (CAGE 13940)
1	Punch and Die Set, Omnidirectional	4303, 4403, 4304, 4404 (CAGE 13940)
1	Punch and Die Set, Unidirectional	4305, 4405, 4304, 4404 (CAGE 13940)

1. Sear cut two 23-inch lengths of MIL-W-43668 1-inch webbing.



674-046

Figure 3-34. Armor Disconnect Pull Handle

a. Insert the end of one 23-inch length of webbing through quick-disconnect strap clip. Fold webbing back underneath two inches and sew webbing together to secure strap clip in place using 3/4-inch crossbox stitch and size E nylon thread staying 1/8 inch from edges of folded end.

NOTE

Ensure dimensions of sewn webbing meet minimum dimensions shown in [figure 3-35](#).

2. Position webbing horizontally on flat surface with strap clip on left. Measure and mark center line on webbing.

a. Measure and mark position on center line 2 1/4 inches from left end of webbing and center punch a hole through the webbing at the mark.

b. Using DOT Snapmaster and unidirectional punch and die set, install snap fastener button (MS27980-1B) and socket (MS27980-6B) with button on top.

3. Turn webbing over and position webbing horizontally on flat surface with strap clip on left and with socket installed in [step 2b](#) facing up.

a. Measure and mark position on center line 2 3/4 inches from right end of webbing. Measuring from this position, measure and mark three more positions at one-inch intervals along the center line for a total of four positions. Center punch a hole through the tape at each of the four marked positions.

b. Using Dot Snapmaster and unidirectional punch and die set, install snap fastener buttons (MS27983-1) and sockets (MS27983-2) in each position. Each button shall be installed on top with directional dot pointing to the right.

NOTE

Each of the four buttons shall be on opposite side of webbing from button installed in [Step 2.b](#).

4. Repeat procedures in [steps 1 through 3b](#) for second quick disconnect strap.

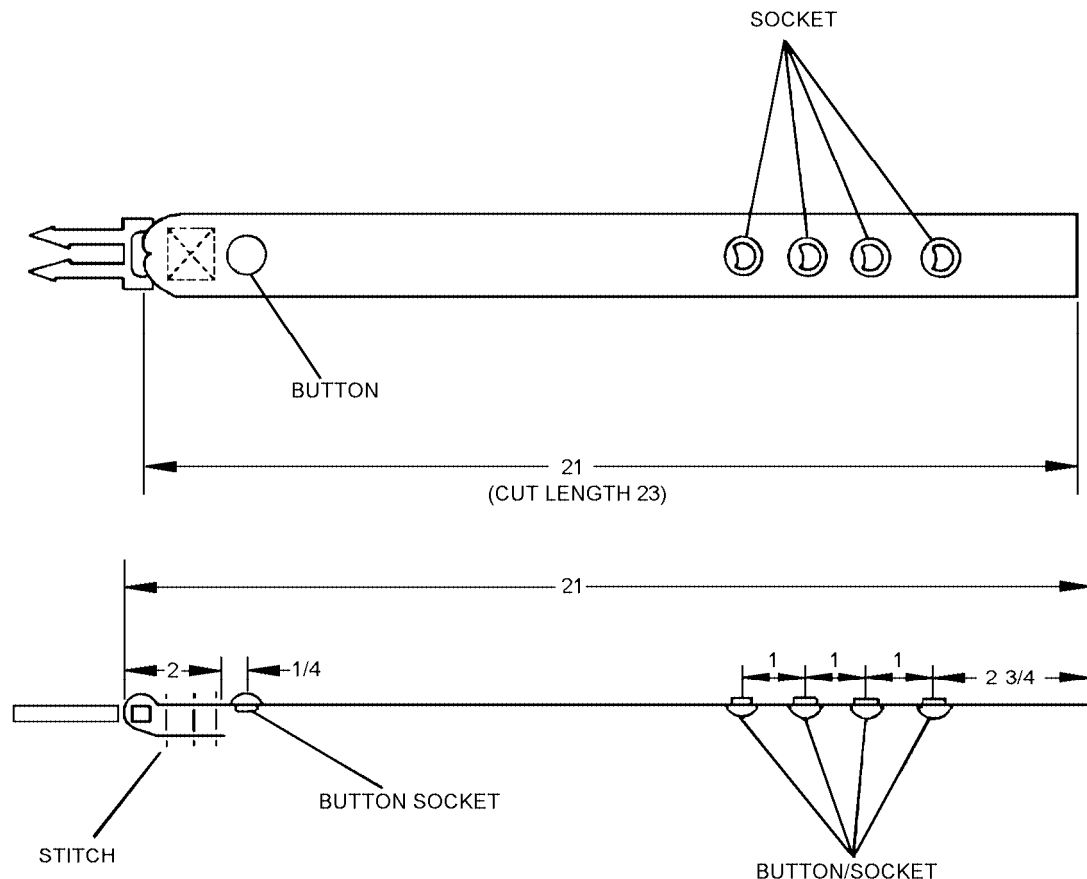


Figure 3-35. Quick Disconnect Strap

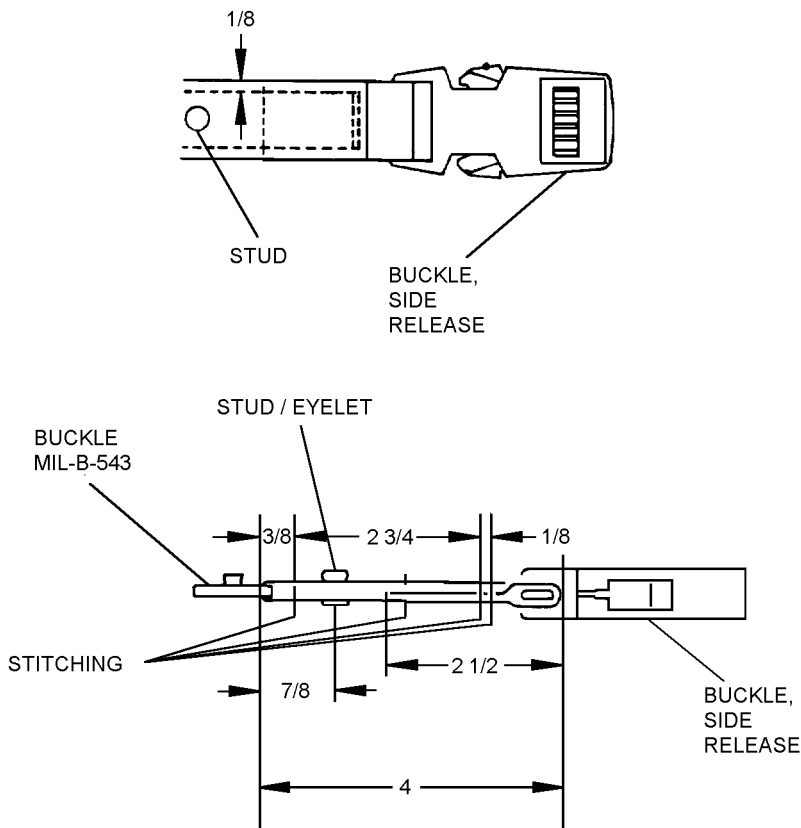
674-047

3-86. FABRICATION/REPAIR OF BACK HARD ARMOR RETAINING STRAP. Refer to [figure 3-36](#) and fabricate/repair back hard armor retaining strap as follows:

Materials Required		
Quantity	Description	Reference Number
As Required	Webbing, Nylon, Type III CL 2, 1-inch, Olive Green	MIL-W-43668 NIIN TBD
As Required	Thread, Nylon, Size E	V-T-295 NIIN 00-204-3884
1	Buckle, 1-inch, Black	MS51927-3 NIIN 00-297-6645
1	Fastener, Snap, Omnidirectional, Eyelet	MS27980-8B NIIN 01-023-3843

Materials Required (Cont)		
Quantity	Description	Reference Number
1	Fastener, Snap, Omnidirectional, Stud	MS27980-7B NIIN 00-842-1879
1	Buckle, Side Release, 1-inch, Black (Female)	101-0100 (CAGE 82399)
1	DOT Snapmaster	89-M840 (CAGE 13940)
1	Punch and Die Set, Omnidirectional	4403, 4404 (CAGE 13940)

1. Sear cut two 9 3/4-inch lengths of 1-inch webbing.



674-048

Figure 3-36. Back Hard Armor Retaining Straps

2. Insert end of one webbing through side release buckle, fold webbing back 2 1/2 inches, and single stitch two webbing layers together 1/2 inch from buckle.

3. Insert opposite end of webbing through slide loop, fold back 3 1/4 inches, overlapping fold made in [step 2](#) and boxstitch three webbing layers together using size E thread staying 1/8 inch from edges of top layer webbing and 3/8 inch from fold at slide loop end.

4. Lay strap assembly on flat surface with slide loop at left and folded side up. Measure and mark position on center line of webbing 7/8 inch from fold at slide loop and center punch hole through strap assembly.

5. Install omnidirectional stud (MS27980-7B) and eyelet (MS27980-8B), with eyelet on bottom, using DOT Snapmaster and punch and die equipment 7/8 inch from buckle end.

6. Repeat [steps 1 through 5](#) for second strap assembly.

3-87. REPAIR/REPLACEMENT OF BACK HARD ARMOR SUPPORT STRAP. To replace/repair hard armor support straps refer to [figure 3-37](#) and proceed as follows:

Materials Required

Quantity	Description	Reference Number
As Required	Webbing, Nylon, Type III, 1-inch, Olive Drab	MIL-W-43688
	or	
	Webbing, Nylon, Type XVII, 1-inch	MIL-W-4088
As Required	Fastener, Tape, Hook, Olive Green, 1-inch	MIL-F-21840
1	Loop Slide, 1-inch, Black	MS51940-9S NIIN 00-664-6395

Materials Required (Cont)

Quantity	Description	Reference Number
As Required	Thread, Nylon, Size E	V-T-295 NIIN 00-204-3884

1. Sear cut 9 1/2-inch length of MIL-W-43688, Type III nylon webbing.

a. Fold one end of webbing back 1/2 inch and sew together using 3/8 x 3/4-inch boxstitch with size E nylon thread. Back stitch 1/2 inch.

2. Cut 4-inch length of MIL-F-21840 1-inch hook fastener tape.

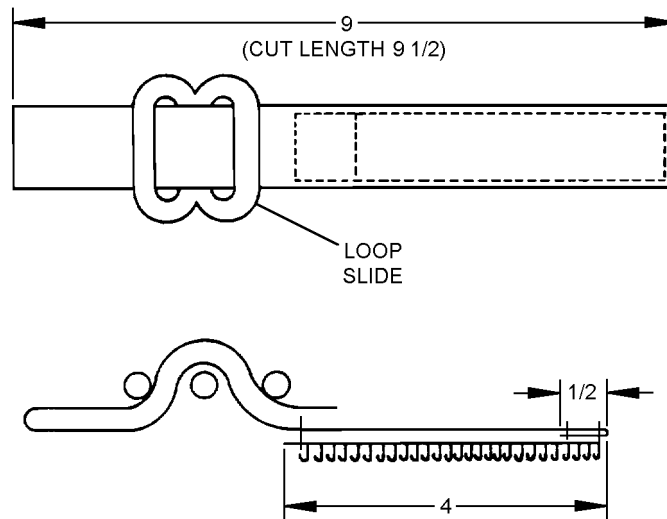
a. Sew 4-inch hook fastener tape to the folded side of the end of 9 1/2-inch strap prepared in [step 1a](#) and boxstitch 3 3/4-inch by 3/4-inch using size E thread, eight to ten stitches per inch. Back stitch 1/2 inch.

3. If a second back support strap is required, repeat [steps 1 through 2a](#).

NOTE

Support straps should be attached to the vest in a manner which will place the hook tape of the strap facing out. Strap may then be wrapped around bottom of hard armor and attached to pile tape on the back of the armor to provide necessary support ([figure 3-32](#)).

4. Reeve free end of support strap through loop slide; then through bottom and over lower horizontal webbing loop of vest and back down to reeve back through loop slide ([figure 3-37](#)). The support straps should be centered on the back of the aircrewmember's vest separated by two vest horizontal webbing loops (approximately 3 inches).



674-049

Figure 3-37. Repair/Replacement of Back Hard Armor Support Strap

3-88. STORAGE.

3-89. The shelf life of the soft ballistic inserts and accompanying casing assembly will depend upon storage procedures and conditions. The soft ballistic inserts should be stored to prevent excessive exposure to ultraviolet rays. Such exposure will degrade the soft armor's protective capability. Service life is programmed for ten years, depending on proper maintenance, handling, and usage.

3-90. With proper maintenance, handling, and storage the hard armor has an indeterminate life span. The hard armor shall be inspected in accordance with [paragraph 3-72](#) prior to and after storage.

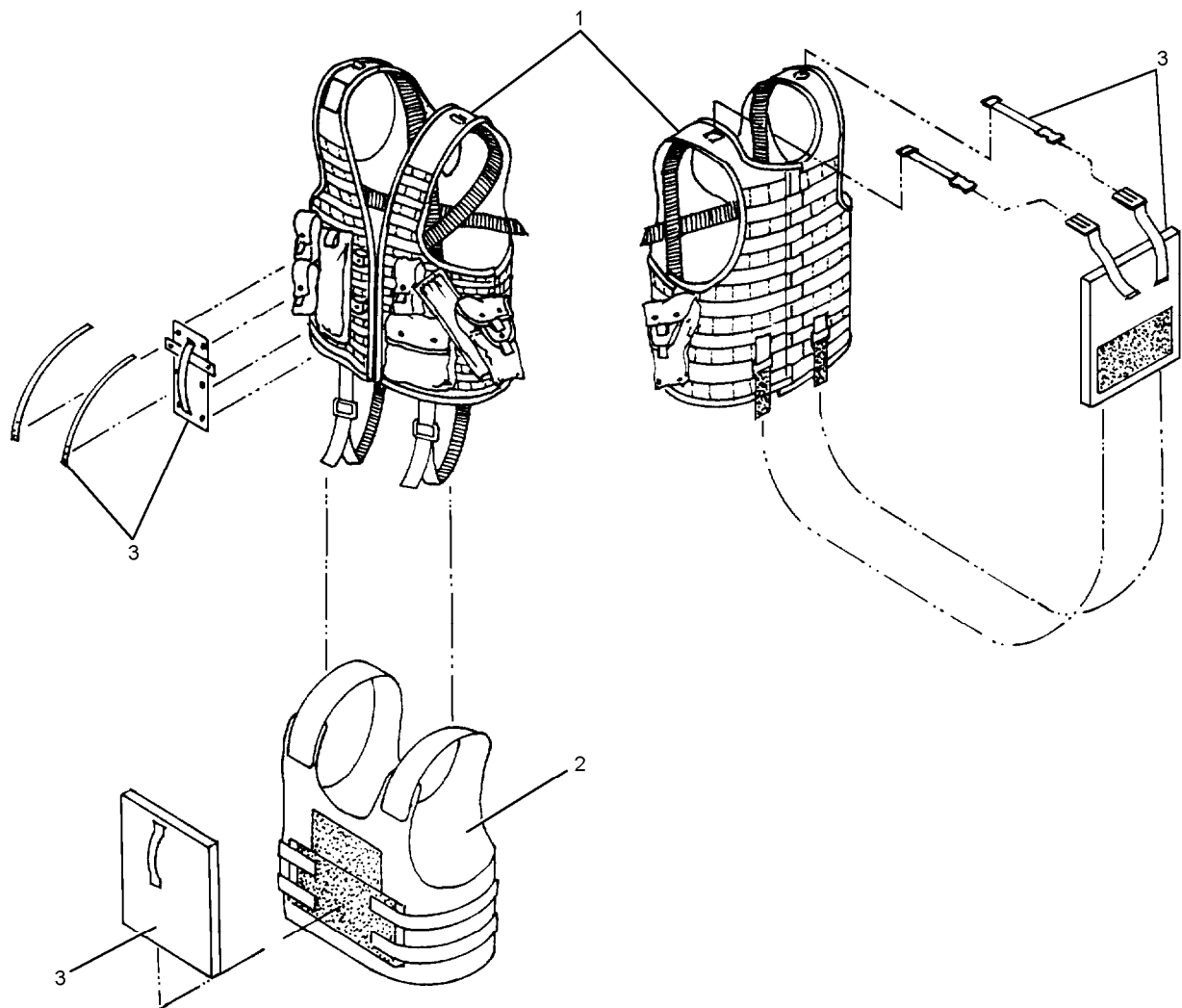
3-90A. PRU-61A/P22P-15 Small Arms Protective Body Armor units must contain the following attaching parts prior to being placed in storage: hard ballistic armor assemblies (front and back), armor beaded pull handle (1), quick disconnect straps (2), back hard armor retaining straps (2) and back hard armor support straps (2).

Section 3-4. Illustrated Parts Breakdown

3-91. GENERAL.

3-92. This section lists and illustrates the assemblies and detail parts of the Protective Assembly, Aircrew Survival - Armor A/P22P-18(V).

3-93. Refer to [Chapter 2](#) of this manual for the detailed explanation of Maintenance Concepts, Scheduling, Documentation, and Illustrated Parts Breakdown Information.



674-050

Figure 3-38. Protective Assembly, Aircrew Survival - Armor A/P22P-18(V)

NAVAIR 13-1-6.7-4

Figure and Index No.	Part Number	Description	Units Per Assy	Usable On Code	SM&R Code
		1 2 3 4 5 6 7			
3-38	3561AS101	Protective Assy, Aircrew Survival - Armor ... A/P22P-18(V)	REF		AOOOG
-1	3561AS301-1	. Survival Vest, CMU-33A/P22P-18(V), Type I (BKDN Fig 3-39)	1		PAOGG
	3561AS300-1	. Survival Vest, CMU-33A/P22P-18(V), Type II (BKDN Fig 3-40)	1		PAOGG
-2	3561AS201-1	. Soft Body Armor, Small Arms Protective PRU-60A/P22P-15 (Medium) (BKDN Fig 3-41) (Note 1)	1		PAOZZ
	3561AS201-2	. Soft Body Armor, Small Arms Protective PRU-60A/P22P-15 (Large) (BKDN Fig 3-41) (Note 1)	1		PAOZZ
-3	3561AS401-1	. Hard Body Armor, Small Arms Protective PRU-61A/P22P-15 (Medium) (BKDN Fig 3-42) (Note 1)	1		PAOGG
	3561AS401-2	. Hard Body Armor, Small Arms Protective PRU-61A/P22P-15 (Large) (BKDN Fig 3-42) (Note 1)	1		PAOGG
Notes: 1. Item is on GSA schedule and can be ordered directly from the manufacturer: Protective Materials Company Telephone: 305-820-4414					

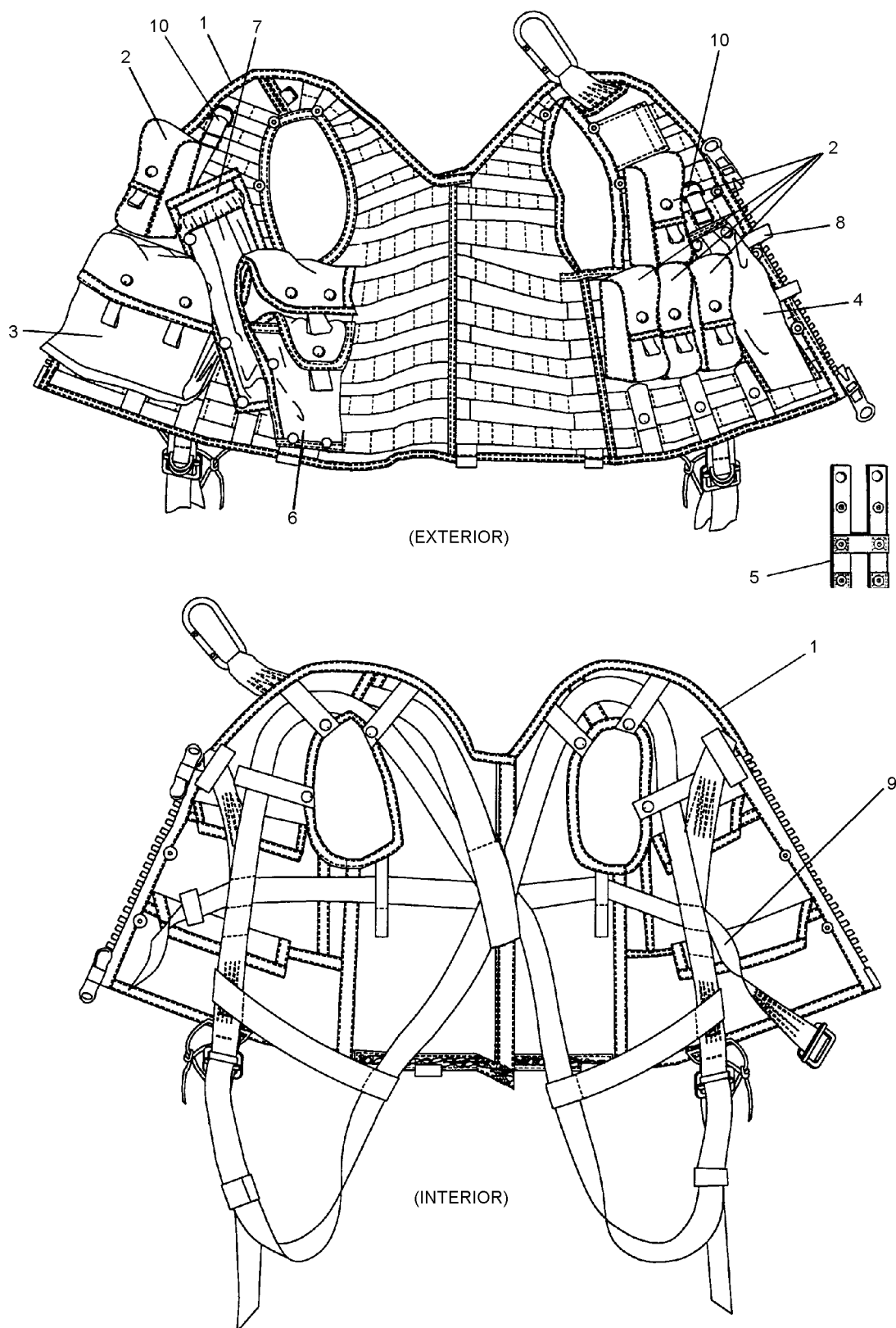


Figure 3-39. CMU-33A/P22P-18(V) Survival Vest, Type I

003039

NAVAIR 13-1-6.7-4

Figure and Index No.	Part Number	Description 1 2 3 4 5 6 7	Units Per Assy	Usable On Code	SM&R Code
3-39	3561AS301-1	Survival Vest, CMU-33A/P22P-18(V), Type (NHA Fig 3-38)	REF		PAOGG
-1	3561AS302-1	. Survival Vest Subassy	1		XAOGG
-2	3561AS310-1	. General Pocket	5		PAOGG
-3	3561AS311-1	. Radio Pocket	1		PAOZZ
-4	3561AS312-1	. Knife Pocket	1		PAOZZ
-5	3561AS308-1	. Oxygen/CBR Attachment	1		MGGZZ
-6	3561AS313-1	. Pistol/Ammo Keeper Pocket (Note 1)	1		PAOZZ
-7	3561AS314-1	. HEED Pocket (Note 1)	1		PAOZZ
-8	3561AS309-1	. Flashlight Keeper Assy	1		MGGZZ
-9	3561AS303-1	. Hoisting Harness	1		MGGZZ
-10	3561AS306-1	. LPU Collar Lobe Attachment Assembly	2		MGGZZ
-11	3561AS316-1	. Oxygen Regulator Pocket, V-22 (Note 1)	1		
-12	3561AS315-1	. SEA/HABD w/Hose Pocket Assembly ... (Notes 1, 2, 3 and 4)	1		
Notes: 1. Optional, must be ordered separately or fabricated. 2. Not illustrated. 3. HABD and SEA used by U.S. Army.					

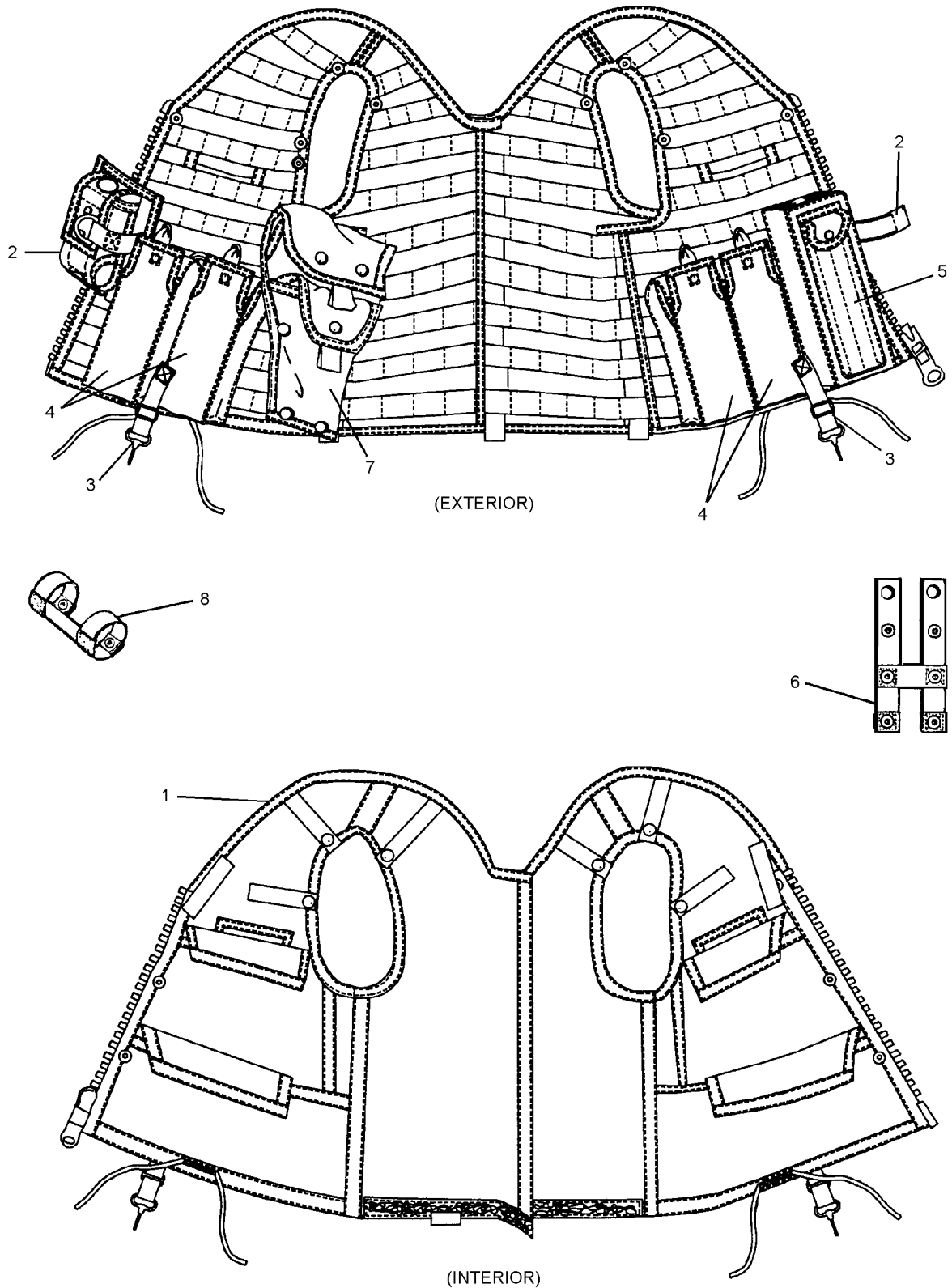
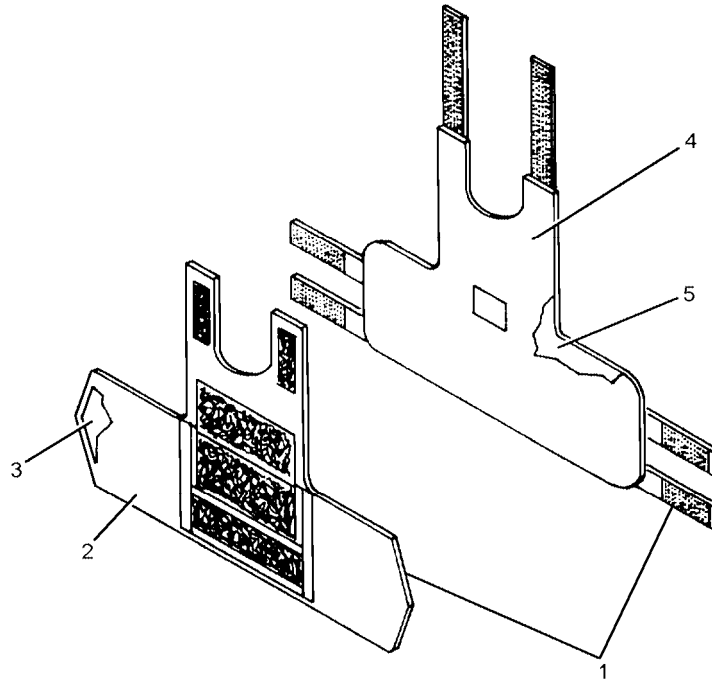


Figure 3-40. CMU-33A/P22P-18(V) Survival Vest, Type II

003040

NAVAIR 13-1-6.7-4

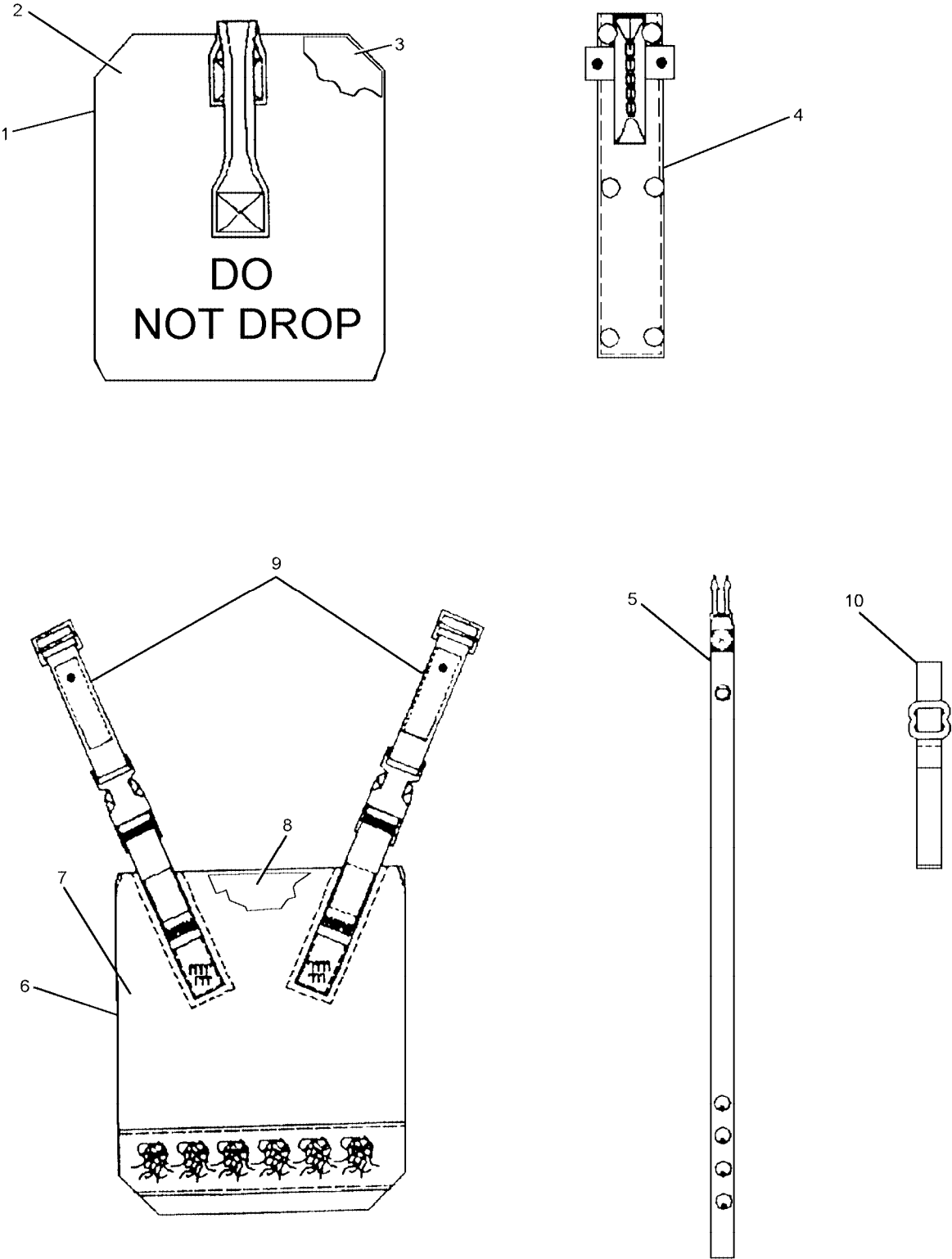
Figure and Index No.	Part Number	Description 1 2 3 4 5 6 7	Units Per Assy	Usable On Code	SM&R Code
3-40	3561AS300-1	Survival Vest, CMU-33A/P22P-18(V) Type II (NHA Fig 3-38)	REF		PAOGG
-1	3561AS302-2	. Survival Vest Subassembly (TACAIR), Type II	1		XAOGG
-2	3561AS316-2	. Oxygen Regulator Pocket	1		
-3	3561AS306-3	. Torso Harness Attachment Assembly (Not E)	2		MGGZZ
-4	3561AS318-1	. General Pocket Assembly, Type II	4		
-5	3561AS319-1	. Radio Pocket Assembly, Type II	1		
-6	3561AS308-1	. Oxygen/CBR Attachment Assembly (Not E)	1		MGGZZ
-7	3561AS313-1	. Pistol/Ammo Pocket Assembly (Not E)	1		PAOZZ
-8	3561AS309-1	. Flashlight Keeper Assembly (Not E)	1		MGGZZ
-9	3561AS317-1	. E-2C Oxygen Regulator Pocket (Not E and 2)	1		
-10	3561AS312-1	. Knife Sheath Assembly (Not E and 2)	1		PAOZZ
-11	3561AS314-1	. HEED Pocket Assembly (Not E and 2)	1		
-12	3561AS315-1	. HABD W/Hose Pocket Assembly (Not E, 2, 3 and 4)	1		
Notes: 1. Optional, must be ordered separately or fabricated. 2. Not illustrated. 3. Local Fabrication. 4. HABD for USN/USMC.					



674-053

Figure 3-41. Small Arms Protective Soft Body Armor, PRU-60A/P22P-15

Figure and Index No.	Part Number	Description	Units Per Assy	Usable On Code	SM&R Code
		1 2 3 4 5 6 7			
3-41	3561AS201	Small Arms Protective Soft Body Armor, PRU-60A/P22P-15 (NHA Fig 3-38)	REF		
-1	3561AS201-1	. Small Arms Protective Soft Body Armor (Medium)	1		PAOZZ
	3561AS201-2	. Small Arms Protective Soft Body Armor (Large)	1		PAOZZ
-2	3561AS203-1	. Front Casing Assy (Medium)	1		XAOZZ
	3561AS203-2	. Front Casing Assy (Large)	1		XAOZZ
-3	3561AS202-1	. Front Soft Ballistic Insert Assy (Medium)	1		XAOZZ
	3561AS202-2	. Front Soft Ballistic Insert Assy (Large)	1		XAOZZ
-4	3561AS203-3	. Back Casing Assy (Medium)	1		XAOZZ
	3561AS203-4	. Back Casing Assy (Large)	1		XAOZZ
-5	3561AS202-3	. Back Soft Ballistic Insert Assy (Med) ...	1		XAOZZ
	3561AS202-4	. Back Soft Ballistic Insert Assy (Lg)	1		XAOZZ



674-054

Figure 3-42. Small Arms Protective Hard Body Armor, PRU-61A/P22P-15

Figure and Index No.	Part Number	Description 1 2 3 4 5 6 7	Units Per Assy	Usable On Code	SM&R Code
3-42	3561AS401	Small Arms Protective Hard Body Armor, . . PRU-61A/P22P-15 (NHA Fig 3-38)	REF		
	3561AS401-1	Small Arms Protective Hard Body Armor, . . PRU-61A/P22P-15 (Medium)	1		PAOGG
	3561AS401-2	Small Arms Protective Hard Body Armor, . . PRU-61A/P22P-15 (Large)	1		PAOGG
-1	3561AS401-3	. Front Hard Ballistic Armor Assy (Med)	1		PAGGG
	3561AS401-4	. Front Hard Ballistic Armor Assy (Lg)	1		PAGGG
-2	3561AS403-1	. . Front Encasement Assy (Medium)	1		XAGZZ
	3561AS403-2	. . Front Encasement Assy (Large)	1		XAGZZ
-3	3561AS402-1	. . Hard Ballistic Armor Insert (Front) . . . (Medium)	1		PAGZZ
	3561AS402-2	. . Hard Ballistic Armor Insert (Front) . . . (Large)	1		PAGZZ
-4	3561AS404-1	. Pull Handle Assembly	1		MGGZZ
-5	3561AS404-2	. Quick Disconnect Strap Assembly	2		MGGZZ
-6	3561AS401-5	. Back Hard Ballistic Armor Assy (Medium)	1		XAGGG
	3561AS401-6	. Back Hard Ballistic Armor Assy (Large)	1		XAGGG
-7	3561AS403-3	. . Back Encasement Assy (Medium)	1		XAGZZ
	3561AS403-4	. . Back Encasement Assy (Large)	1		XAGZZ
-8	3561AS402-1	. . Hard Ballistic Armor Insert (Back) (Medium)	1		PAGZZ
	3561AS402-2	. . Hard Ballistic Armor Insert (Back) (Large)	1		PAGZZ
-9	3561AS404-3	. . Back Hard Armor Retaining Strap Assy	2		MGGZZ
-10	3561AS404-4	. . Back Hard Armor Support Strap Assy	2		MGGZZ

NUMERICAL INDEX

Part Number	Figure and Index Number	Part Number	Figure and Index Number
3561AS101	3-38		3-40-6
3561AS201	3-41	3561AS314-1	3-39-7
3561AS201-1	3-38-2		3-40-13
	3-41-1	3561AS315-1	3-39-12
3561AS201-2	3-38-2		3-40-14
	3-41-1	3561AS316-1	3-39-11
3561AS202-1	3-41-3	3561AS316-2	3-40-2
3561AS202-2	3-41-3	3561AS317-1	3-40-9
3561AS202-3	3-41-5	3561AS318-1	3-40-4
3561AS202-4	3-41-5	3561AS319-1	3-40-5
3561AS203-1	3-41-2	3561AS401	3-42
3561AS203-2	3-41-2	3561AS401-1	3-38-3
3561AS203-3	3-41-4		3-42
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3561AS300-1	3-38-1		3-42
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3561AS301-1	3-38-1	3561AS401-4	3-42-1
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3561AS302-1	3-39-1	3561AS401-6	3-42-6
3561AS302-2	3-40-1	3561AS402-1	3-42-3
3561AS303-1	3-39-9		3-42-8
3561AS306-1	3-39-10	3561AS402-2	3-42-3
3561AS306-3	3-40-3		3-42-8
3561AS308-1	3-39-5	3561AS403-1	3-42-2
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3561AS309-1	3-39-8	3561AS403-3	3-42-7
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3561AS310-1	3-39-2	3561AS404-1	3-42-4
3561AS311-1	3-39-3	3561AS404-2	3-42-5
3561AS312-1	3-39-4	3561AS404-3	3-42-9
	3-40-12	3561AS404-4	3-42-10
3561AS313-1	3-39-7		

APPENDIX A

U.S. ARMY PROGRAM DATA

U.S. Army Survival Item List

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
(a) FIG. NO.	(b) ITEM. NO.	SMR CODE	NATIONAL STOCK NUMBER	CAGE	PART NUMBER	DESCRIPTION	U/M	QTY UNIT	REQ'T
			MANUALS			OPERATOR'S MANUAL	BK	1(Note 1)	X
			TM 1-1680-TBD-10			MAINTENANCE MANUAL	BK	3(Note 2)	X
			SIGNALING DEVICES						
		PAOZZ	5820-00-782-5308	4655	01-524795-1	Radio Set, AN/PRC-90 Survival	EA	1	A1
		PAOZZ	5820-01-158-6082	18560	AN/PRC-90-1	..Radio Set	EA	1	A1
		PAOZZ	5820-01-238-6603	19560	AN/PRC-90-2	..Radio Set	EA	1	A1
		PADLL	6135-00-838-0706	81349	MIL-B18267	..Battery, (FOR AN/PRC-90 Radio only)	EA	1	A1
		PAOZZ	5820-01-279-5450	18560	AN/PRC-112	AN/PRC 112, Radio, Pocket	EA	1	X1
		PADLL	6135-01-235-4168	81349	BA5112U	..Battery, (FOR AN/PRC-112 Radio only)	EA	2	X1
		PAOZZ	6230-01-378-4077			Light, Marker Distress, Firefly II	EA	1	X2
		PAOZZ	6230-00-938-1778	81349	MIL-L-38217	Light Marker, Distress, SDU-5/E	EA	1	A2
		PAOZZ	6135-00-073-8939	90303	BA-1574/U	..Battery, BA 1574/U	EA	1	A2
		PAOZZ	6230-00-401-2285	18560	FGIC	..Flashguard, AGR-FG1B	EA	1	A2
		PAOZZ	6350-00-105-1252	81349	MIL-M-18371	Mirror, Emergency Signaling	EA	1	X3
		PAOZZ	8465-00-254-8803	81349	MIL-W-1053	Whistle, Ball Plastic O.D. (w/lanyard)	EA	1	X4
		PAOZZ	1370-00-490-7362		1370-L-119	Kit, Personnel, Distress, A/P25S-5A	EA	1	X5
		PADLL	1370-01-030-8330		DL3139734	Signal, Smoke and Illumination, MK24	EA	2	X6
		PAOZZ	6850-00-270-9986			Sea Dye Marker	EA	1	O7
			GENERAL						
		PAOZZ	4020-00-240-2146			Cord, Fibrous, 32 or 36 strand, (550 cord), 50' length		(700 yd roll)	O8
		PAOZZ	4240-01-160-5618		8702	Fire Starter, Magnesium	EA	1	X9
		PAOZZ	1680-01-233-0061		SL3	Fire Starter, Aviation, Spark Lite	EA	1	A9
					MFG# 7188FH	Fire Starter, Wax Cloth 2" x 7 3/4" (8 per pkg)	EA	1	X10
		PAOZZ	9920-00-985-6891	81348	EE-M-101	Matches, Safety, Humidity Resistant: Box of 30	BG	1	X11
		PAOZZ	9920-99-966-9432			NATO: Matches, Wind/Water Safety (boat matches)	EA	1	A11
		PAOZZ	7340-00-098-4327		MIL-K-8662	Survival Knife and Sheath W/sharpening stone	EA	1	X12
		PAOZZ	5110-01-346-5341			Multi-plier, Gerber (black finish)	EA	1	X13
		PAOZZ	5110-01-279-9332			Multi-plier, Leatherman	EA	1	A13
		PAOZZ	6605-01-196-6971	90640	MIL-STD-2073	Compass, Magnetic Unmounted, Lensatic	EA	1	X14
		PAOZZ	9110-00-263-9865	81349	MIL-F-10805	Fuel, Compressed, Trioxane, Bars	BX	3	X15
		PAOZZ	9525-00-596-3498			Wire, Non-electric (Snare wire), (12' segment)	EA	1	O16
		PAOZZ	9535-01-201-7014			Aluminum Foil, Heavy, 2' x 2'	EA	1	X17
		PAOZZ	9535-00-752-9061			Metal Foil, 2' x 2' (36" x 250' roll)	EA	1	A17
		PAOZZ	7920-00-241-3336			Sponge, Cellulose, type II (olive drab)	EA	1	X18
		PAOZZ	8465-00-634-4499		MIL-B-8571	Bag, Storage, Drinking Water, 3 Pint	EA	1	A19
			FOOD/WATER						
			NSN not assigned			Food Packet, Survival, Aircraft, Life Raft	EA	1	A20
		PAOZZ	8925-00-160-6161	63298	A-A-20175	...Gum, Chewing	HD	2	X20
		PAOZZ	8925-00-823-7101	63298	A-8-20177	...Candy, Charms	EA	2	X20
		PAOZZ	8960-01-124-4543			Water packet, 4 oz	EA	4	O21
			8960-01-000-0000			Bottle, Water, 4 oz	EA	2	A21
			MEDICAL						
		PAOZZ	6505-01-288-2188	98634	LE701	Sunscreen	BT	1	X22
		PAOZZ	6508-01-265-0079			Lipstick, Antichap, Cold or Hot Climate	EA	1	X23
		PAOZZ	6510-00-203-6010		UP 401	Moleskin, surgical, type III 3" x 5" pad.	EA	1	X24
		PAOZZ	6510-00-926-8881			Tape, surgical, woven, 1/2" x 3 yd roll	EA	1	X25
		PAOZZ	6515-00-383-0565	81349	MIL-T-368045	Tourniquet, Non-Pneumatic, Camouflage	EA	1	X26
		PAOZZ	6515-00-926-8954			Penrose Tubing	BX	1	A26
		PAOZZ	6840-01-288-2188			Insect Repellent and Sunscreen Prep, 1oz	EA	1	X27
		PAOZZ	6840-00-142-8965	80882	00501	Insect Repellent, 1 OZ.	EA	1	O27
		PAOZZ	7210-00-935-6666			Blanket, Thermal, Silver/OD, 96" x 56"	EA	1	X28
		PAOZZ	7210-00-935-6667		MIL-B-36964B	Blanket, Thermal, Silver/ Orange, 96" x 56"	EA	1	X29
		PAOZZ	8520-01-373-6833			Towelette, Moist	EA	3	O30
		PAOZZ	8540-00-119-1426			Paper, Toilet Tissue, 12 sheets 2-ply pkg.	EA	1	O31
		PAOZZ	8315-00-787-8000			Pin, Safety	PG	4	X32
		A0000	6545-01-120-2632	89875	1-653	Survival Kit, Individual, Trop, Tact, Aircrew	EA	1	X33
		PAOZZ	7610-01-301-5255			List, Medical Instruction-Content	SH	1	X34
		PAOZZ	4220-01-181-3154			Fishing Kit, Emergency	EA	1	X35

U.S. Army Survival Item List (Cont)

(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
(a) FIG. NO.	(b) ITEM. NO.	SMR CODE	NATIONAL STOCK NUMBER	CAGE	PART NUMBER	DESCRIPTION	U/M	QTY UNIT	REQ'T	
		PAOZZ	6505-00-009-5060			Doxycycline Hyclate Caps	PG	14	X36	
		PAOZZ	6505-00-982-0288			Erythromycin Ophthalmic Ointment, USP, 1/8 oz	EA	1	X37	
		PAOZZ	6505-01-238-5632			Lopermide HCL Capsules, (5 tablets)	PK	1	X38	
		PAOZZ	6510-00-054-7255			Skin Closure Adhesive	PG	10	X39	
		PAOZZ	6510-00-913-7906			Bandage, Gauze, 2" x 5 yds	EA	1	X40	
		PAOZZ	6510-00-913-7909			Bandages, Adhesive, 3/4" x 3" (5 per pkg)	PK G	1	X41	
		PAOZZ	6510-01-203-6285			Pad, Povidone-Iodine Impregnated Gauze, 9x3"	EA	1	X42	
		PAOZZ	6515-00-296-2529			Saw, Flexible, Steel Wire, 16"	EA	1	X43	
		PAOZZ	6515-01-363-1212			Razor, Surgical Preparation	EA	1	X44	
		PAOZZ	6695-00-118-2918			Bag, Food	PG	3	X45	
		PAOZZ	6850-00-985-7166			Iodine, Water Purification (50 per btl)	EA	1	X46	
		PAFZZ	8105-00-837-7754			Bag, Plastic, 6" x 6" resealable	EA	1	X47	
		PAOZZ	8415-01-192-2357		MIL-S-37205	Headnet and Mittens, Mosquito (set)	EA	1	X48	
		PAOZZ	8520-00-551-0375			Soap, Non-Medicated	EA	1	X49	
		PAOZZ	9920-01-191-3434			Match Safety Humidity Resistant, 2x1.50x0.25"	PG	1	X50	
		PAOZZ	6840-01-278-1336			Permethrin Insect Repellent (Bosina)	EA	1	A51	
		PAOZZ	6840-01-284-3982			Deet Insect Repellent (Bosina)	EA	1	A52	
			SURVIVAL VESTS							
		PAOZZ	NSN not assigned			Survival Vest, Type I, AIRSAVE, CMU-33A/P22P-18(V)	EA	1	X53	
		PAOZZ	NSN not assigned			Armor, Soft, PRU-60A/P22P-15	EA	1	O53	
		PAOZZ	NSN not assigned			Armor, Hard, PRU-61A/P22P-15	EA	1	O53	
			OVER WATER							
		PAOZZ	8475-01-240-8316			Helicopter Emergency Egress Device, SRU-36/P	EA	1	O54	
			TBD			Low Profile Flotation Collar, LPU-34/P	EA	1	X55	
		PAOZZ	4220-00-850-8655	80049		Life Preserver, Underarm, LPU-10/P	EA	1	A55	
		PAOZZ	4220-01-120-4894			Life Preserver Unit, LPU-21/P	EA	1	A55	
		PAOZZ	4220-01-272-8004		1521AS102-1	Vee Bottom Boat, LRU-18/U	EA	1	O56	
		PAOZZ	4220-01-364-4480		1680-ALSE-01 5	Container, Vee Bottom Boat	EA	1	O56	
			X= Mandatory for item No. O= Optional A= Alternate		NOTE: 1. Required for each operator 2. Required in each aviation unit					

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 310-1; the proponent agency is the US Army Adjutant General Center.						Use Part II (reverse) for Repair Parts and Special Tools List (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE
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<i>*Reference to line numbers within the paragraph or subparagraph</i>							
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